

# SUPPLEMENT.

## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The Mining Journal is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2460.—VOL. LII.

LONDON, SATURDAY, OCTOBER 14, 1882.

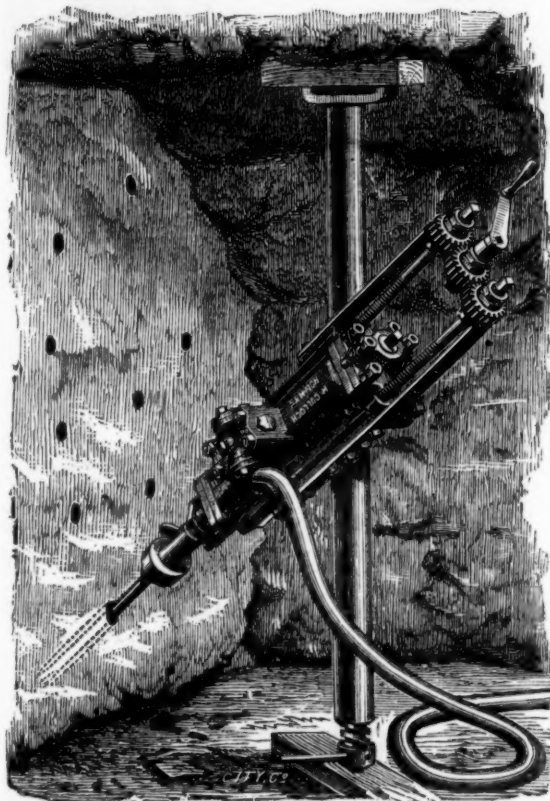
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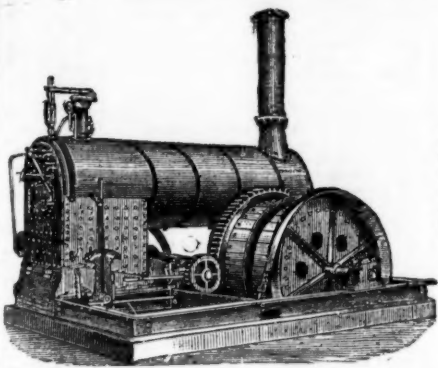
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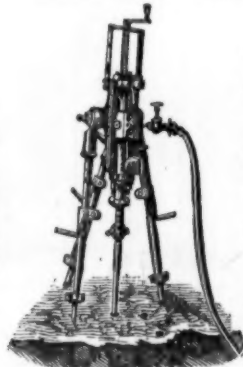
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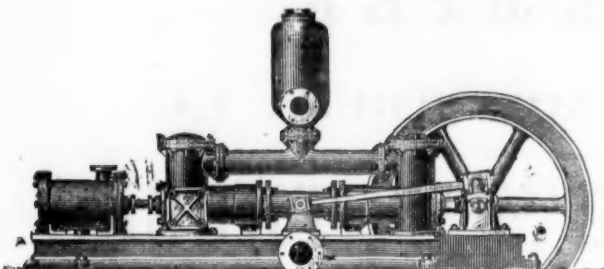
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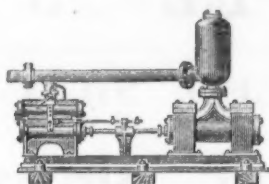


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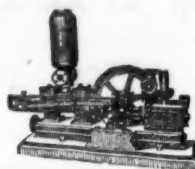
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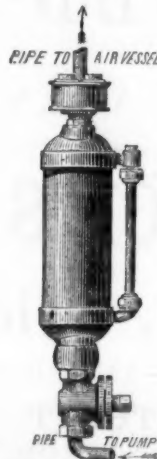
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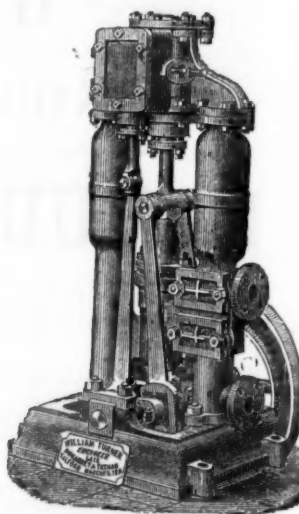
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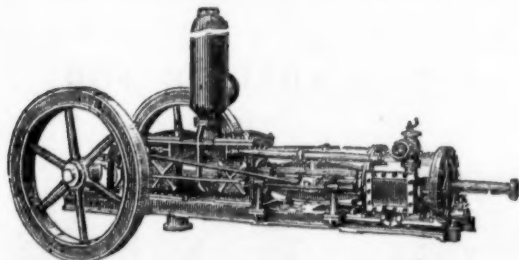
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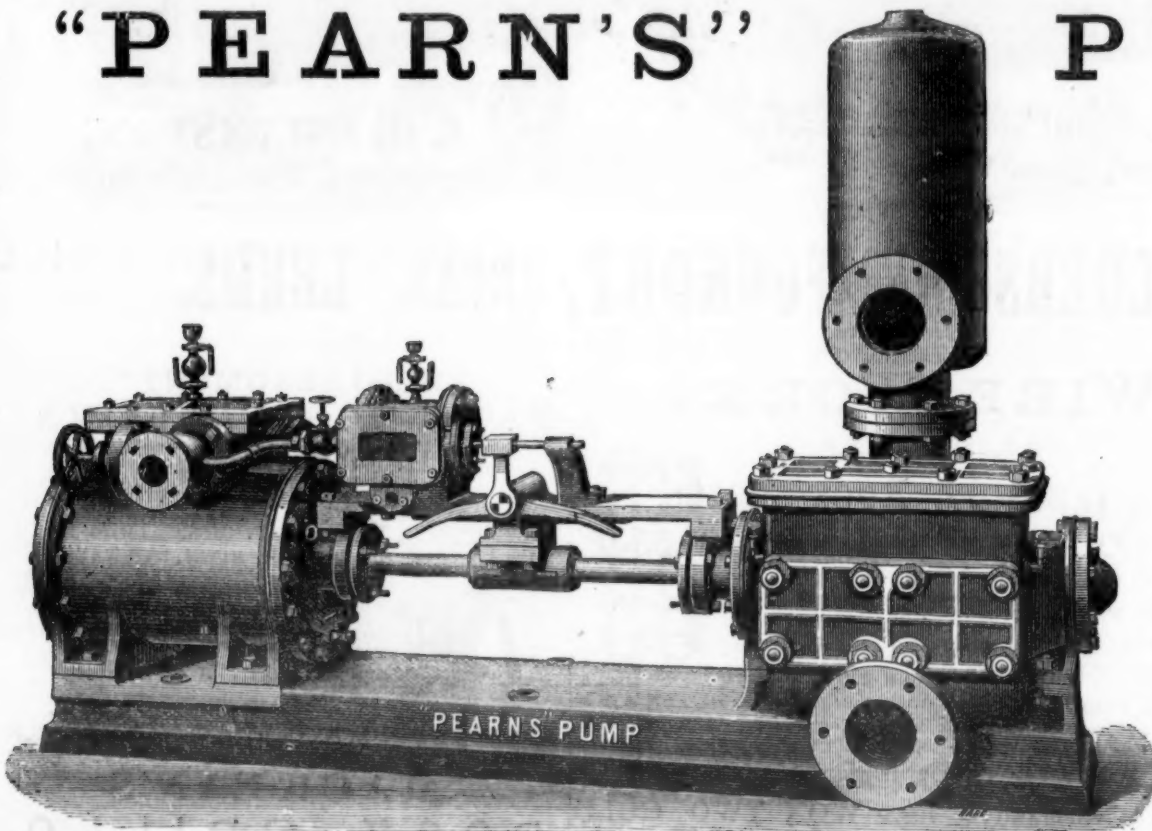
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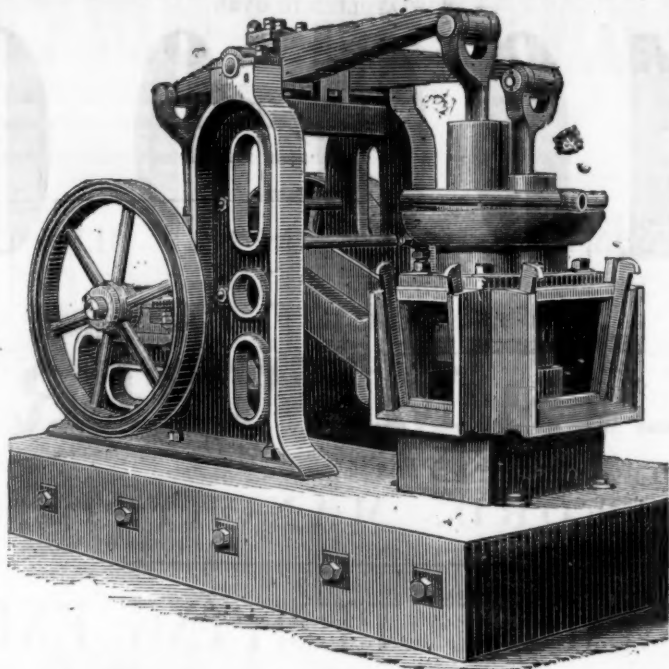
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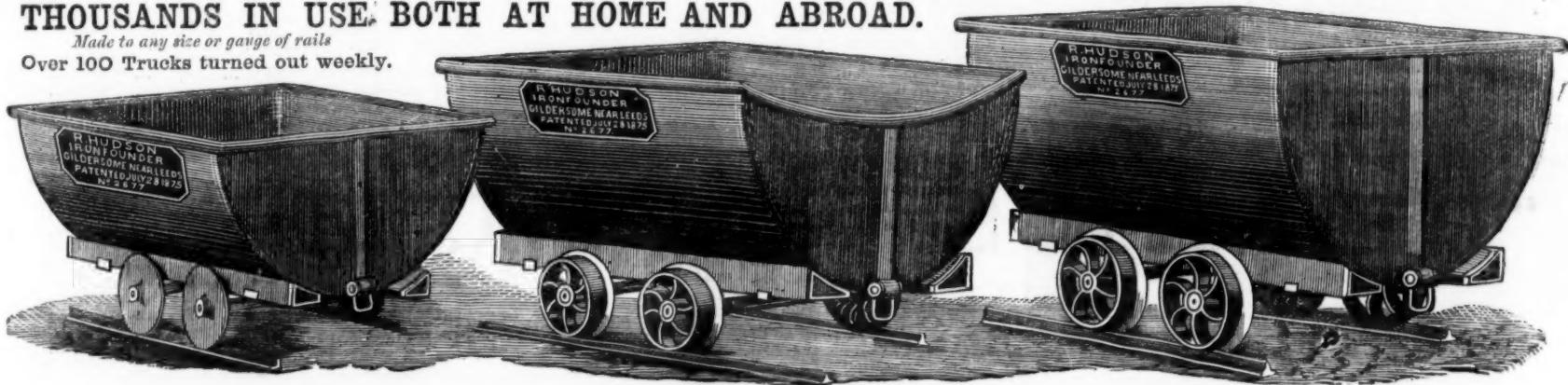
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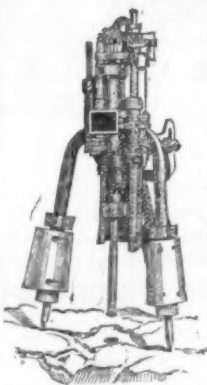
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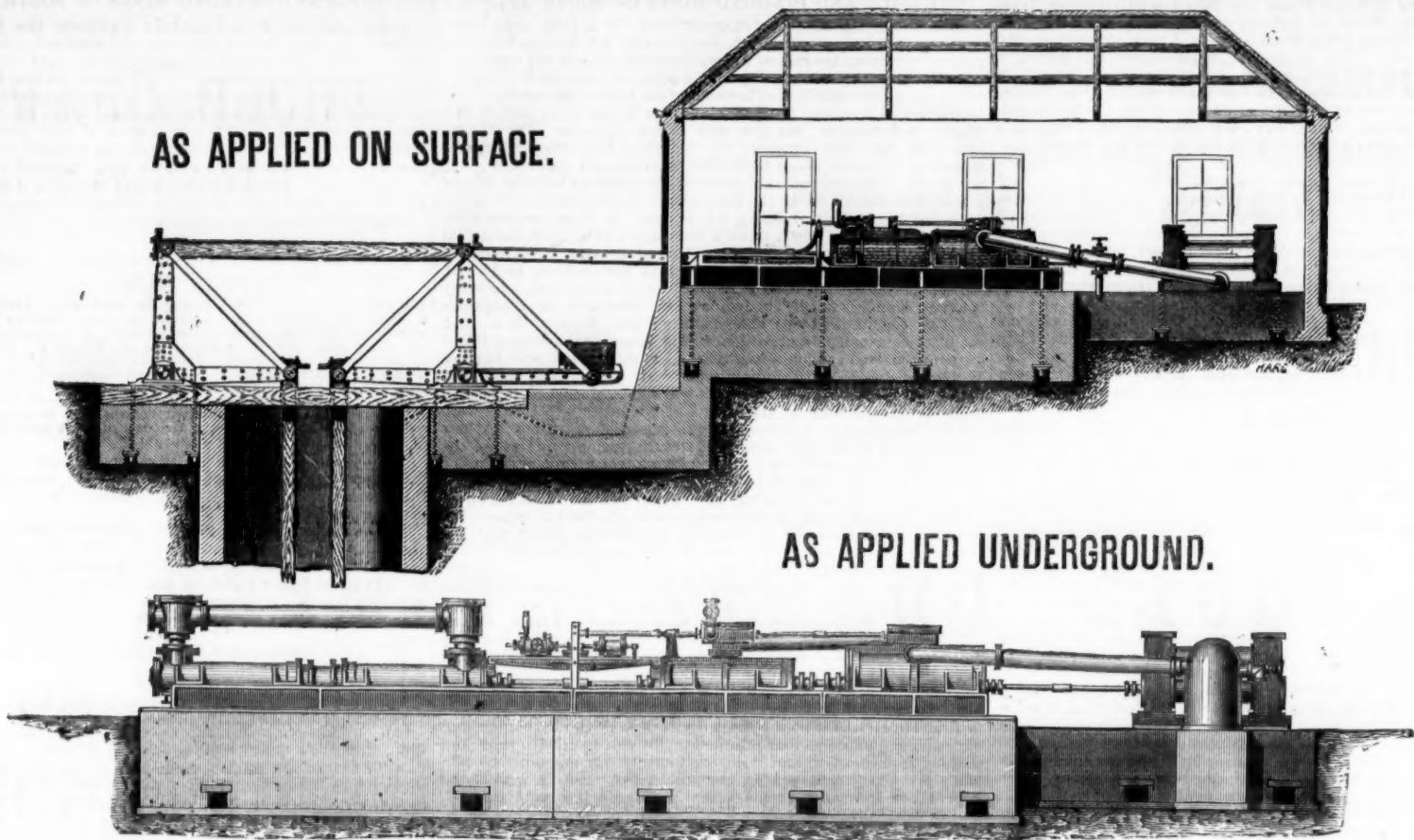
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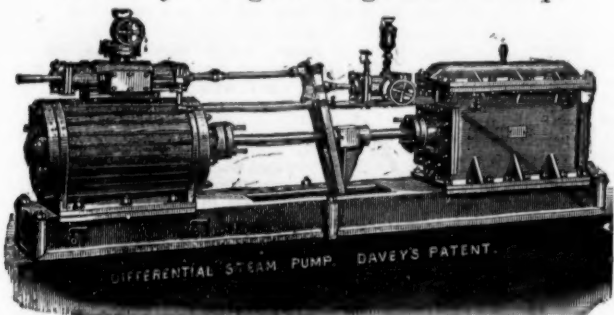


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12	6	24	6,500	250	90	104	130	4	2	2
12	7	24	10,500	180	96	110	136	5	2	2
12	8	24	13,500	140	100	114	142	6	2	2
12	10	24	21,300	90	120	136	175	7	2	2
14	7	24	10,400	250	110	130	156	5	2	3
14	8	24	13,500	190	120	145	165	6	2	3
14	9	24	17,300	150	130	150	172	6	2	3
14	10	24	21,300	120	140	162	190	7	2	3
14	12	24	30,800	80	160	190	216	9	2	3
16	8	24	13,700	250	140	170	195	6	3	3
16	9	24	17,300	200	150	180	215	6	3	3
16	10	24	21,300	160	160	196	225	7	3	3
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This Turbine is applicable to all heights of fall. It works immersed in the fall-water, so that no part of the fall is lost, and the motion of the Wheel is not affected by floods or back-water.

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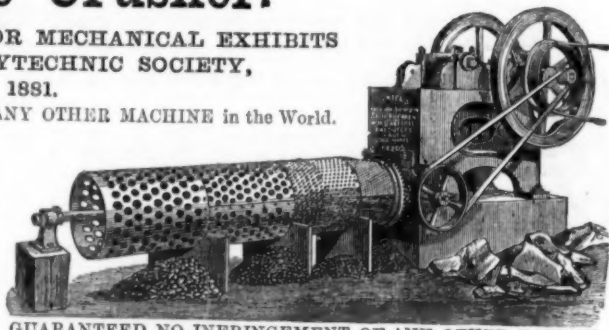
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The Bold Venture Lime and Stone Co., Peak Forest, Messrs. W. H. Baxter and Co., June 8, 1881.

GENTLEMEN,—We have the pleasure to inform you that the 20 by 9 Stone Breaker supplied by you is now working to our entire satisfaction, and we are now able to fulfil our contract with ease, which we had much difficulty in doing before with the Blake Machine. It takes less power and turns out considerably more stone.

Yours truly, BOLD VENTURE LIME AND STONE COMPANY.



GUARANTEED NO INFRINGEMENT OF ANY OTHER PATENT.

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## Original Correspondence.

## A TRIP TO COLORADO—No. I.

BY THOMAS CORNISH, M.E.

Author of "Gold Mining, its Results, and its Requirements."

On receiving instructions to proceed to Colorado, U. S. America, to inspect some mining properties, I made my arrangements for departure, and left Glasgow by the s.s. Bolivia (one of the Anchor line of steamers running between there and New York) on Aug. 4, and on the following morning found the ship was anchored in Loch Foyle, off Moville, North of Ireland, waiting for passengers from Londonderry. Having a few hours to wait, I took the opportunity of going ashore with a few of my fellow-passengers, and paying a first visit to the Emerald Isle, and going out a few miles in an Irish jaunting car to visit the ruins of an old castle called Green Castle, said to have been built by and the residence of one of the ancient kings of Ireland, and which was demolished during Cromwell's invasion. The country around here looked fertile, and under good management should produce good crops. Moville as a quiet watering-place offers a pleasant retreat from the bustle of city life, and an opportunity of benefiting by the invigorating breezes of the North Atlantic. At 2 P.M. on the 5th, having received our complement of passengers from the Green Isle, the anchor was weighed, and we soon steamed away quickly, leaving Old Ireland behind. After a smooth and pleasant passage across the Atlantic Ocean in the company of very agreeable and social fellow-passengers, and the courteous attention of the officers of the ship, arrived at New York on the evening of the 15th. On the following morning the ship and passengers having been duly passed by the health officer and custom authorities the passengers parted company, and were soon scattered over this great country to their various destinations. To anyone who has been somewhat hardened by experience of affectionate greetings and partings on board ship it was amusing as well as interesting to watch the sundering of the chords of affection that had become entangled during a 10-days' acquaintanceship, and favourable opportunities for love-making, and the little rivalries that arose between the aspirants to the favours of the attractive and accomplished belle of the Bolivia, but whether the impressions created will be of a lasting character the test of time will tell.

My first impressions of New York City were that while it presented all the features of a thriving, bustling, and wealthy city, the important question of drainage has been sadly neglected. Landing at the wharf during a heavy rain the streets presented a very rough and dirty appearance, and from the slovenly way the pavement of the streets is laid the filth and drainage soaks into the sandy soil under the pitches, causing a most disagreeable odour to arise that must not only be unhealthy to permanent residents, but creates an unfavourable impression to the new arrival as to the salubrity of the climate. The extensive system of tramways which permeate the city and suburbs is one of the great features of New York; but there is room for great improvement in the method of laying down the rails, and I am surprised to see so little attention has been paid to that question. The elevated railways running up and down some of the main line of streets, while not interfering with the ordinary street traffic, affords a safe, rapid, and easy means of passenger transit from one end of the city to the other, and may be introduced with advantage into many of the crowded thoroughfares of our great cities in England; the facility with which the engines and carriages wind round the corners of streets on such sharp curves is remarkable, and could be scarcely credited except by actual observation. The introducers of this novel method of aerial travelling met with considerable opposition to its introduction, but its general usefulness and safety appears to have overcome original prejudices. The Brooklyn Bridge, the great connecting permanent highway between New York and Brooklyn cities, is a magnificent structure, reflecting the highest credit upon American enterprise, and the professional skill and ability of its designers, engineers, and builders associated with its construction. It is a high level suspension bridge, spanning the East River with a centre span of about 1600 ft., and about 135 ft. above high-water mark, the four cables carrying the weight of the bridge resting on saddles fixed on the top of two towers 285 ft. above high-water mark. The cables are formed by the concentration of a series of single wires, galvanised and coated in oil, first bound in bundles about 3 in. in diameter, and the series of bundles bound in one massive cable 15 in. in diameter, by machinery specially designed for the purpose. The details of the process, and the method adopted for testing the strength and the desired flexibility of each separate wire, as also the joining of each wire together, was minutely explained to me by Mr. C. C. Martin, first assistant engineer, who kindly showed me over the works. There are many other matters of great interest in and around the City of New York that time nor space will permit my noticing, and which have received due attention from others more competent to deal with them.

I left New York on the evening of Aug. 17 for the Far West, making a short stoppage at Philadelphia; but, it being night, had no opportunity of seeing anything of the city, except that immediate to the railway station, or depot as it is termed here. Taking the Pennsylvania Central route, I passed through Harrisburg on to Pittsburgh, the great centre of the iron and coal district of the State of Pennsylvania. The city was surrounded with a dense atmosphere of smoke; but that, in consequence of the strike amongst a large portion of the workers, it was then comparatively clear. Passed over the Alleghany Mountains during the night, and at the break of day saw the celebrated Horseshoe Bend. The scenery about here was grand, but from thence the scenery was uninteresting; passing through several small towns with iron and steel works, and coke-kilns, and the heart of the coal country, the mining for which being apparently chiefly done by tunnelling; from thence to Wheeling Junction, West Virginia, on the Ohio river, over which is a very fine bridge. The districts passed through have a great variety of manufactures in iron and woollen works; from thence to Columbus, the chief city of the State of Ohio, is a thickly-settled and prosperous looking farming country; a similar description of country throughout the State; on to Indianapolis, the chief city of Indiana, a long stretch of good farming country and well settled towns, and as the constant filling and emptying of the trains with a well-to-do people testified the prosperity of the population along the route; through the State of Illinois to the rapidly rising city of St. Louis, situated on the banks of the great Mississippi river, being a great emporium of the corn and cattle trade of the Far West prairies, and a great concentration of rival railway lines, all of which appear to get plenty of traffic; the river is crossed by a very high bridge, constructed of iron on granite piers. After breakfasting at St. Louis we proceed on the continuous route through the State of Missouri, and for many miles skirting along the banks of the "Mighty Missouri, which rolls to the sea," after a junction with the Mississippi about 20 miles above St. Louis. All through the State of Missouri is a vast extent of rich farming lands, and on portions of which some excellent crops of corn are raised and herds of cattle. From the appearance of the country in pushing along, I should think this State possessed some of the richest lands in America. From Jefferson City, the capital, on to Sadalia, in time for tea, but where we had to be delayed in consequence of a collision that occurred a few miles beyond, through one train trying to pass another on a single track; fortunately, it occurred to a freight and repairing train, instead of our passenger train.

I did not hear that anyone was seriously injured. From thence on to Kansas City, the capital of the State of Kansas, situated on its eastern boundary, arriving there about 9 P.M. Saturday, Aug. 19, after two days' and nights' travelling from New York. Feeling inclined for a comfortable sleep, I indulged in a sleeping berth in a Pullman car, and on waking next found we were bounding along over the Kansas plains, which extend over a dreary and monotonous prairie land for about 600 miles; the best of the land is chiefly in the eastern part of the State; but along the whole line of railway the country is settled, more or less, as far as can be seen. Every few miles along the line rising towns are springing up, and land agents are advertising large lots of land for sale at from \$3 to \$5 per acre. It was in crossing these dreary plains that so many of the emigrant trains to the gold fields in California in the early days came to grief, and were

massacred by the Indians; this was the home of the buffalo and the antelope as well as the red-skins; but they have nearly all vanished before the march of civilisation. Antelopes are to be shot on some parts of the plains, as it was served up at meals in some of the refreshment places along the route. These plains extend a long distance over the eastern part of Colorado, up to Denver City, the capital, which I reached on Monday, Aug. 20, the fourth day of continuous travelling from New York in hot weather, and over a very dusty part of the country, and feeling quite glad to get into comfortable quarters at the Windsor Hotel.—Denver, Colorado, Sept. 9.

## THE GOLD AND DIAMOND MINES OF SOUTH AFRICA.

SIR,—Your readers will remember that for a long time I have continually called attention to the fact that the Mining Board are positively ruining the richest known diamond mine in the world, and consequently they are ruining the mercantile and other industries which have been established here under the belief that mining would be conducted here very much the same as in any other part of Her Majesty's dominions; but alas, such is not the case. The Mining Board has the entire control of the celebrated Kimberley Mine, estimated to be worth about 8,000,000l. sterling, and the scenes which are often witnessed at the deliberative meetings of that august assembly if carried on in the lowest grog shanty here would be the means of the proprietor losing his license. It is as necessary for speculators to know how a mine is controlled as to know the actual value of the deposit, and therefore, rich as I know the Kimberley Mine to be, I strongly advise capitalists to have nothing to do with the concern until the Mining Board is done away with, and every company stand or fall by its own merits. Several of the companies are like the impecunious Press parasites who support them, and ought to be avoided as a pestilence. The affairs at the Mining Board have now arrived at such a pass that unless the Government dissolve the board and take the administration of affairs into their own hands it is my candid opinion that it will end in bloodshed, inasmuch as at the last meeting of the board pick-handles and pistols were freely discussed, and members thought more of providing for their own personal safety than attending to the general interest of the mine. The Diamond News in referring to a recent private sitting of the Mining Board, from which the reporters and the public were excluded, under the bold heading of "A Scene at the Mining Board," endeavours to gloss over a very disagreeable affair as follows:—"We have heard from several members of the Mining Board that Mr. Robinson has once more turned the Mining Board office into a bear garden—this time Mr. Olsen was the special object of his attack. The latter seems to have suggested a basis for the assessment of the mine, which the former characterised as the production of a madman or an idiot. Mr. Olsen objected to this, and appealed to the Chairman for protection; but that gentleman refused to do his duty and call Mr. Robinson to order, whereupon the latter waxed furious in his denunciation of Mr. Olsen, and leaving his chair, walked round the table to Mr. Olsen's chair, and in true pugilistic attitude dared him to oppose him any more. Mr. Olsen being in a delicate state of health refused to accept the challenge to a pugilistic encounter, and our popular junior member returned to his seat livid with rage, and shaking from head to foot with excitement." In consequence of it being previously arranged to hold the above meeting with closed doors there are many persons here wicked enough to say the attack on Olsen was premeditated.

At the last public meeting of the Mining Board Mr. Olsen proposed the following resolution:—"If during the meeting of the board or during the sitting of any committee any member use threats of violence towards any other member, or leave his seat for the purpose of assaulting or striking any other member he shall be expelled, and not allowed to resume his seat during the remainder of the sitting, and that the Chairman take the necessary steps to carry out this rule." Mr. Stalb seconded the resolution, and suggested that a policeman be called to attend the board meetings. The matter was fully discussed, Mr. Josephs defending. Mr. Robinson wanted the mover to give notice, but Mr. Olsen said—"I object. People here sit in danger of their lives; and I object to the dissolving of the meeting. If he (Mr. Robinson) cannot silence members by kicking up this row he dissolves the meeting." Mr. Josephs strongly objected to Mr. Olsen's resolution being put, whereupon Mr. Olsen requested the Chairman to "ask Mr. Josephs if he intended kicking up a row." Mr. Bottomly considered the matter ought to be decided at once, inasmuch as not a single member of the board was safe. Mr. Sedgewick said—"Oh! I am," and intimated that he could fight two Robinsons. Mr. Bottomly said—"Everyone is not like Mr. Sedgewick. The thing might happen so suddenly that we could not put ourselves in defence. A certain member suddenly leaps from his seat, and another member seems to be in danger of his life. If it had been some other member who had been rounded upon we cannot tell what might have been the result. Having in view the importance of keeping up the respectability (!!!) of the Mining Board, by very great self-restraint Olsen kept himself in command. Had Robinson come round to Sedgewick there would have been a bust up; and had he come round to Mr. Solomons I think Solomons' hot blood would have gone out at the end of his fists. I do not know what I should have done. I am a Yorkshireman and a local preacher, and I think I should have had one or two Yorkshire blows at him whatever might have been the result. I think it necessary to pass these rules. It appears that Mr. Olsen is actually in fear of his life. He would not bring a pick-handle, but he might bring something still more dangerous, and the result might be the pointing of a pistol." After a great deal of talk of a similar character the resolution was put and carried.

In again bringing this matter prominently to the notice of your readers I do so entirely in defence of our mines, which if properly conducted would be an unqualified success, but which in consequence of the unseemly squabbling of the Mining Board are being irretrievably ruined.

I notice that the Editor of the Advertiser continues to malign the Mining Journal and myself; but your readers will know what estimate to place on his articles when I inform them that he is believed to be the paid servant of the Mining Board, and sets a very high value on his billet. His articles on mining are unintelligible, but to do him justice, on insolvency and breach of trust he is an authority. The Independent is generally considered the most dependent paper on these fields, and devotes itself to supporting a cause in which it is generally considered the dry-rot has set in. The Diamond News is without doubt the most reliable authority on diamond mining of any paper in this country, and as a rule places all matters in connection with our great industry before the public without varnish.

It is possible I may be leaving here shortly, but before doing so I would advise all your readers who are interested in diamond mining to read the Diamond News. For tendering this advice I shall be accused by some nincompoops of being interested in this paper; but I know your readers will believe me when I say I have no interest directly or indirectly in any paper or mine in this place. Such a thing as writing for the benefit of the public is incomprehensible to the servile individuals who may be seen here daily, running about with half-written articles craving the approval of their patrons. It is the first time I have referred to these accomplished vilifiers, and it is certainly the last.

Mining is still very dull. In the case of the Central Company v. the Mining Board judgment has been given in favour of the company; in the first case for 25,265l. and costs, and in the second case for 9000l., each party paying their own costs. The Central Company have still another action against the Mining Board for 130,000l. Mr. Stalb, on behalf of the French Company, has given notice that he shall bring an action against the board for 20,000l.; and Mr. Sedgewick, on behalf of the South-East Company, has given notice that he shall bring an action against the board for 100,000l. Under the control of such a governing body as the Mining Board it is marvellous that any of the companies ever pay dividends.

A cablegram has been received here saying the Mining Journal has taken over the plan of the Kimberley Mine. I, therefore, purpose in my next letter to explain the nature of the plan, and the position of the various companies. News from the Transvaal points to a great deal of distress on the new fields, which are by no means so good as the old ones.

Small-pox throughout the colony still causes a great deal of anxiety, and some legislators are so scared that they wish to establish a quarantine between the towns and villages. I have just heard that a diamond the size of a hen's egg has been found by a Negro somewhere near the Vaal River, but I cannot vouch for the truth of the rumour.—Kimberley, Sept. 14.

P.S.—I have just received a telegram saying that the De Kaap gold fields are of no value. I omitted to mention that in consequence of a detachment of police being present at yesterday's meeting of the Mining Board, the anticipated fight did not come off.—C.

## GOLD AND DIAMOND MINES OF SOUTH AFRICA.

SIR,—Allow me to contradict a statement that appeared in the Journal the week before last, that my husband, the late Mr. A. W. Armfield, had abandoned as unpayable the gold reef which he discovered on the Farm Graskap (better known as Mac Mac) and called Armfield's Reef. My husband having been appointed inspector and prospector of gold fields in the Transvaal did in his last letter, after having prospected the greater portion of that country, assure me that he had seen nothing to compare in richness with our claim at Mac Mac, and which in his opinion only required capital to prove one of the most payable reefs he had seen. I trust that you will give this the same publicity as the statement I complain of.

Northumberland-place, London, Oct. 8. M. J. W. ARMFIELD.

## THE PREMIUM FOR FIRST PARCEL OF ANGLO-INDIAN GOLD.

"It has been announced that during the week some of the principal shareholders in the Wynnad concerns have arranged to provide a fund of 2000l., of which 1000l. is to be given to the manager of the mine who first produces 500 ozs. of gold from the mine, of course; 500l. to the second producer of 500 ozs.; and 500l. to be equally divided amongst the staff of the two mines, at the discretion of the managers. It has been suggested by certain dealers that if this 2000l. be invested in the Three per Centa. at once, the amount distributable to the staff might be somewhat augmented by the accrued interest at the date of the award; but it must be admitted that the 2000l. alone should suffice to encourage energy and secure early dividends if there really be any reefs in the Wynnad, which can be profitably wrought."

SIR,—With reference to the above paragraph which appeared in the Mining Journal of Sept. 17, 1881, I am anxious to obtain the fullest information in reply to the following enquiries made by our manager and staff:—

The award for the first 500 ozs.—The staff have been enquiring about this; they understood it to be 1000l. for the manager, 500l. for the captain, and 500l. to be divided amongst the staff. As they are all certain that we shall be the first to get the 500 ozs. they are naturally anxious to know how the thing stands, and you would oblige me by letting us know if there is anything in it.

W. H. THOMPSON, Sec.,  
The South-East Wynnad Estates and Gold Mining Company.  
Queen Victoria-street, Oct. 7.

## CURIOUS PHENOMENA OF INDIAN GOLD REEFS.

SIR,—Many of your readers are no doubt aware that some of the gold-bearing quartz reefs which two or three years ago existed in some four or five properties in the Wynnad district, and belonged to as many different mining companies, have since their discovery by Professor Vazie Simons totally disappeared. This phenomenon, though so extraordinary, does not appear to have excited the attention it deserves. For myself I must say I was not only astonished at the disappearance of these reefs, I was also disappointed, for I was peculiarly interested in two or three of the companies. However, Professor Milnes's letter in the Times of the 10th inst., and a leader in the paper of the 11th, apparently affords some clue to the mystery, for according to the writer of the leader the heaving of the earth, which seems to be always going on more or less "intermittently"—now here, now there—"grows into a spasm, and wealthy cities and fruitful plains are engulfed."

Here is the explanation of the gold reefs in the Wynnad—they are intermittent, and have recently been engulfed in some "mighty earth spasm;" but let the shareholders keep up their spirits, some fresh spasm may cause them to be cast up again and richer than ever. When Professor Simons found them he got specimens of quartz, showing by analysis 2 to 60 ozs. per ton. When they reappear no doubt they will be even richer than that, and give me and the rest of the gulls 1000 per cent. on our "investment" (!) for many years to come. "J.S." thinks it is time to speak out about the mines in the Wynnad district. If someone who knows all the facts would speak out it would be unpleasant for some people.

R. P.

## FRONTINO AND BOLIVIA GOLD MINING COMPANY.

SIR,—I had intended writing you last week, but am not sorry for the delay, as it has afforded me an opportunity of first learning Mr. Donagan's views. I think all shareholders in the Frontino are indebted to him for his communication; as, in fact, they are to anyone who will honestly investigate the company's affairs and favour them with the result of his investigations; for it is good that they should be kept acquainted with what concerns them. Directors thereby see that their management of the company's interest is watched, and so become more careful and vigilant, and if the individual who will watch and from time to time report the result of his watching to his fellow-shareholders should fall into error, still the very correction of the error does good. The directors have expressed surprise that I did not send Mr. Truran's letter to me of Sept. 9 for publication in the Mining Journal, though Mr. Foakes had usually complained that I should send any communications to you at all, for he argued that it injured the company. I do not know if Mr. Donagan is satisfied with the information he has obtained from the directors and with the company's present prospects, but my desire is the same as his—that we may immediately experience dividends—quarterly dividends—and for my part I am sorry to say I do not yet see them.

I will now deal with some of the points of his letter, so far, at least, as they appear to me to affect the questions raised. As to the names of the parties from whom the Cordoba and Garibaldi Mines were purchased. At the recent meeting of the company I enquired who the vendors were, and Mr. Foakes said he could not tell me. When pressed through your columns with the question he answered they were "two small Colombian companies." When told that that is not enough he remained silent, till I wrote the Secretary, and the latter replied that Cordoba was purchased from "the Cordoba Mining Association" and Garibaldi from the "Garibaldi Mining Association." Now, the two mines are said to have been conveyed—to whom? To the company? No! but to Mr. White. But the company have paid for them. Again, Mr. Foakes does not know the names and addresses of the members of the two associations. Then to whom were the purchase-moneys paid? The directors in their report of Jan. 7 last, signed by Mr. Foakes, stated that the owners of the Cordoba mineral rights had commenced an action against our company, claiming the timber, and it was to get rid of that litigation that Cordoba was purchased. And yet in the face of all the facts—litigation, compromise, negotiation, purchase, payment of purchase-money, and assignment of the mines, Mr. Foakes did not know at the general meeting who the vendors were, and now does not know any members of the Cordoba "Mining Association." Who executed the deed of assignment of the mine? Do Mr. Foakes and his colleagues intend to shelter themselves behind the old, worn out defence that they left it to Mr. White? If so let us have it, and let them candidly tell us that they remitted 4800l. to Mr. White and there the responsibility of the purchase of Cordoba ended so far as they were concerned. But shareholders will surely know that more than this is required of directors; and that when our company was in litigation with "the Cordoba Mining Association" they ought to have ascertained of whom the association consisted. Bear in mind, it is not a joint-stock English company, registered under our English law, but "a small Colombian mining company" or "association," and when the deed assigning over the property to our company was executed, some individuals of flesh and blood must have signed it. Yet the directors do not know the name of anyone.

Similar remarks apply to the Garibaldi purchase. It has been



bought, paid for by the company, assigned to Mr. White, confirmed by our shareholders, yet Mr. Foakes could not tell me at the recent meeting who the vendors were, and neither he nor the other directors knew the name of a single individual forming the Association. Now is this satisfactory? Remember that with regard to Cordoba the surface rights had been acquired by our company before the purchase from the Cordoba Mining Association. As to payment for the mines the price of Cordoba was 4800*l.*, and of Garibaldi 3200*l.*—together 8000*l.*. The purchase of Garibaldi was spoken of in the directors' report of January last, as at the option of the shareholders who could decline, or resell, or work it. And at the meeting on Jan. 17 Mr. Foakes told the shareholders this—that the price of Garibaldi was 3200*l.*, that the shareholders were not bound to take it, yet positively the company had months before actually paid for the property, not 3200*l.*, only but 3500*l.*, by bills as follows:—

Bill.	Account.	Due.
48 White on Wiske .....	£500	May 25, 1881
57 " " " " " " " " " "	1000	Sept. 26, 1881
58 " " " " " " " " " "	1000	Oct. 29, 1881
59 " " " " " " " " " "	1000	Nov. 1, 1881
60 " " " " " " " " " "	1000	Dec. 2, 1881

And observe that the three latter bills were drawn upon Mr. Foakes personally.

As to Cordoba it was paid for by bills thus:—

No.	Date.	Drawn.	Payee.	On Account.	Account.	Due.
50	April 30 <sup>th</sup>	R. B. White.	Restrop.	Cordoba.	£800	June 28, July 31.
62	Aug. 28 <sup>th</sup>	"	Posada.	"	100	Nov. 1, Jan. 2, 1882
63	"	"	"	"	200	"
64	"	"	"	"	200	"
65	"	"	"	"	500	"
66	"	"	"	"	500	"
67	"	"	"	"	500	"
78	Mar. 2, 1882 <sup>th</sup>	J. B. White.	"	"	1000	May 25, July 25.
79	"	"	"	"	1000	May 24, July 26.

These totals for the two mines amount to 8300*l.*. Now the directors in their accounts treated the payments for the mines as having been made thus: In the half-year ending June, 1881, 1300*l.*; and in that ending December, 1881, 6700*l.*=8000*l.*. And they debit the company in the latter half-year with 6200*l.* on the loan account. Mr. Foakes says in his letter to the Journal of Aug. 10 that this 6200*l.* was borrowed thus: Oct. 12, 5000*l.*; Dec. 31, 1200*l.*=6200*l.*. With the 5000*l.* the directors paid to revenue account 1300*l.*; and the three bills Oct. 29 and 30, 3000*l.*=4300*l.*.

In my letter of Aug. 15 I asked Mr. Foakes how much of the 200*l.* charged for the loan of the 6000*l.* went to the revenue account in return for the 1200*l.* he says was borrowed from that account, but he has not favoured me with an answer. I will now ask him another question—to point out in the profit and loss accounts for the half-year ending June, the items in which the 1300*l.* advance was included, and in that for December, 1881, the items showing its repayment; and, again, I press him to say how much was credited to revenue account for interest for the loan.

Mr. Donagan and Mr. Foakes both admit that when the 5000*l.* was borrowed on Oct. 12 it was 700*l.* more than was then required, but the former says this is mere detail, and should not be cavilled at. So again in the December half-year's accounts, the total 8000*l.* is charged as having been paid, whilst the fact is that 2000*l.* was not paid till January 2 (two days only after the half year I admit), and 2000*l.* till the end of the following July. Is all this detail which should not be cavilled at?

And now let us consider the prospects of dividends, for I wish to see them. I can go hand in hand with Mr. Donagan in that desire. At the half-yearly meeting held on Dec. 18, 1880, Mr. Foakes stated—"We have our mines already developed. We hope in future to pay you dividends every three months. Of course that must depend upon the produce of the mines, but looking as far ahead as January the dividend will be between 2*s.* and 2*s.* 6*d.*, and he spoke of Mr. White's prediction as to future dividends being larger than that." Now, at that time the Pocuné Water was not in use. Cordoba did not belong to our company, nor did Garibaldi, and large sums of capital have been spent in acquiring that water and those mines, and in developing the whole of the company's property. What has been the result? Two dividends only have been paid—that of 2*s.* in January, 1881 (above spoken of), and another of 1*s.* in July, 1882. That is, a capital in 1880 of 120,000*l.*, since increased to 144,000*l.*, has received in one year and nine months less than 5 per cent. on the present market value of the shares. Is this because there is not mineral in our mines? Certainly not. Let us look at the three last monthly reports issued to us since the general meeting held on July 19 last to consider Mr. Robert B. White's report on the mines. These reports are for the month of May, June, and July, 1882, and deserve some comparison with the general report of Mr. Robert B. White, to which I refer. In the latter report Mr. White stated—"Whereas in the year 1879 we could barely produce from the mine 1000 tons of mineral, and not only possessed no reserves to speak of, but were positively short of mineral in many of them we can now, leaving the Cordoba out of the question, turn out of our mines 3400 tons of mineral per month without in any way affecting the reserves, further that we possess reserves which will enable us to tide over any bad or unfavourable changes which the mines may from time to time present, and not only this, but that in the year 1879-80 we could at the utmost only reduce 1500 or 1600 tons of mineral, making use of all the water supply then available. We now have water enough to reduce not only the 3400, but over 5000 tons of mineral if our works are sufficiently extended." Now what say the three monthly reports in question as to the mineral exclusive of Cordoba:—In May, extracted 1645 tons; stamped 1607 tons; June, extracted 1738 tons; stamped 1736 tons; July, extracted 1537 tons; stamped 1594 tons = 4937 tons, or an average per month of 1640 tons extracted, and 1646 tons stamped, so that the quantity of mineral extracted as well as that stamped, including a slight trespass on the reserves, is less than one-half of what Mr. White reported could be done without encroaching on the reserves. Then as to Cordoba, Mr. White said in his report:—"I believe that I can promise you an output of mineral of 900 tons per month, which ought to leave a profit of 1500*l.* per month, or even of 2000*l.*, if, as I believe, we are so fortunate as to find the Ruiz lode go down so rich in depth as we have seen it." Now, for the three months given above the output from Cordoba was—Mineral extracted: May, 430 tons; June, 478 tons; July, 398 tons = 1306 tons, or average 435 tons per month. —Stamped: May, 439 tons; June, 478 tons; July, 383 tons = 1300 tons, or average 433 tons per month. Again, the mineral from Cordoba is less than half what Mr. White reported could be obtained, whilst as to the profit of 1500*l.* per month the matter is simply ludicrous, for from the whole of the mines put together very little more than half the 1500*l.* per month, and less than half the 2000*l.* per month has been made, whilst if the profit and loss account for the past four months be taken the result is worse still. For the three months in question the profit from all the mines including Cordoba, was—May, 457*l.* 13*s.*; June, 1290*l.* 7*s.*; July, 985*l.* 6*s.*=2733*l.* 6*s.*, or averaging per month 911*l.* 2*s.*. Are you content with the prospect of dividend, Mr. Donagan? If so, lucky are the directors in having such a shareholder. Do you still think that great allowances are to be made for the increased expenses to which the company are put in sending stores from England? If so, look at the matter in another aspect.

In his general report Mr. White says:—"I am well aware that our mining operations must be judged from a practical point of view, that the real question is, how much mineral and gold can you produce, and what will it cost you to produce it? Now, this I agree is a fair test. Let us try the three months already considered by it. In May the gold produced and bought was 2264*ozs.*, worth 5813*l.*; in June, 2927*ozs.*, worth 7326*l.* 4*s.*; and in July, 2684*ozs.*, worth 6803*l.* = 7876*l.* 4*s.*, worth 19,942*l.* 4*s.*. The total cost was—May, 5355*l.* 7*s.*; June, 6035*l.* 17*s.*; July, 5817*l.* 14*s.* = 17,208*l.* 18*s.*; leaving a profit for three months of 2733*l.* 6*s.*. Thus, out of 20,000*l.* (in round figures) of gold produced only 2733*l.* finds its way to this country, and this has to go first in payment of office rent, salaries, and directors' fees. In other words, for every 1*l.* of gold produced at the mines the company get 2*s.* remitted home. The total capital of the company is (in round figures) 132,000*l.*. To pay 10 per cent. thereon 13,200*l.* would be required, whilst the profit said to be made at the mine for the three months in question is at the rate of 10,932*l.* only.

Would this be a fair return for capital invested in mining enterprise? Our directors receive these monthly reports, issue them with an amount of detail which few shareholders have time to investigate, and then Mr. Foakes, the Chairman, has the courage to address the shareholders and tell them that he or the board are entitled to their warmest thanks! The matter of the Cordoba and Garibaldi Mines, and the alleged loan of 6000*l.* in connection therewith, have not yet been satisfactorily explained; but if shareholders are content it must remain for a time as it is. I have little doubt in my own mind that there is detail in connection with the company's affairs that requires scrutiny. But if shareholders prefer to go on in ignorance of what affects them no individual member can alter it. The time will come when things will appear more clear or more cloudy. I hope it will not then be too late.—*Serjeants' Inn.* J. J. SEAL.

#### FRONTINO AND BOLIVIA MINES.

SIR,—Mr. White has been away from the mines now nearly six months I believe, and shareholders are enquiring as to his return, which no one appears to know, and are also asking if his presence at the mines is at all important, as the directors appear in no hurry to hasten his return. Probably the directors are of opinion that his brother is able to manage the property as well without as with him. Oct. 11. ONE WHO WISHES TO KNOW.

#### THE NEW QUEBRADA MINING COMPANY.

SIR,—I have read with interest the discussion on the respective merits of the Spanish and South American copper companies that has taken place in the Journal, and am pleased to see that Panulillo are so highly thought of, as I pointed them out as a neglected security when they were about half their present price. The history of these companies shows that considerable patience is required by a shareholder before he can realise the full fruit of his labours. My object in writing you now is to call attention to the above company as one on which the labour and money has been expended, and which for the following reasons appears to me about to yield the fruit. The output for the first five months of the current year shows an increase over 1881 of 50 per cent., and 1881 was 50 per cent. over 1880. The price of copper has risen very much, and as the agreement for conveying the ores with the Bolivar Railway will now turn largely in favour of the mine, I expect before long to see the shares quoted at a considerable premium. Anyone purposing investing in the shares of any of the copper companies should study the address of the Chairman (The Honourable C. T. C. Bruce, M.P.) to the shareholders on Aug. 4 last. The Messrs. Matheson, who came to the assistance of the Rio Tinto Company in their difficulties, must have great faith in the New Quebrada or they would not have constructed the railway which now links the mine with the coast. INVESTOR. Edinburgh, Oct. 11.

#### THE NEW CALLAO—COMPANY FLOATING AND MANAGEMENT—AN AUTOCRATIC VENDOR.

SIR,—In asking your consideration of the following it would be interesting to know what the verdict of a body of right thinking English speaking gentlemen would be. On April 27, 1881, a special circular containing a first refusal overture till May 3 was addressed to the shareholders of certain companies, calling their attention to the prospectus of the New Callao, one of the features of which was the option afterwards referred to, which was then believed would realise a profit more than sufficient to repay every shilling of the purchase of this company, to be returned as a bonus to the shareholders. Allotment letters on application following thereon were issued on May 6, 1881, and on June 7 thereafter the shareholders were informed by circular that about 15,000*l.* had thus been privately subscribed to the undertaking, which would shortly be publicly advertised, but giving the then shareholders a seven days' opportunity to increase their holdings, also enclosing the late Captain Robotham's report. The prospectus stated the New Callao property to be to the west of the El Callao and neighbouring group of mines, which even with Mr. Skertchley's report therewith might be construed by any one unacquainted with the country to be in the vicinity thereof. It also stated—(1) the property to be about 250 acres of proved mineral ground, with full water and timber rights, and free from all rents or royalties; (2) the purchase consideration was 30,000*l.* equally in cash and shares; (3) adjoining this property are 750 acres, which the directors consider equally valuable, and they have secured the option of purchase for six months from the 5th inst. (April, 1881) on similar terms to the purchase. In this option they are satisfied they have been very fortunate, as each day mineral ground is becoming of fabulous value \* \* \* and even already enquiries have been made after this option with the view of purchase; and (4) "no promotion money in any shape has or will be paid."

In July a second prospectus appeared informing us—(1) that 20,000*l.* had been privately subscribed; (2) that the property was held at a nominal rent of 60*l.* per annum, and "(3) that the enquiries to purchase the option were at such terms as would return 10*s.* in the 1*l.* on the entire purchase-money, but greater results are anticipated." On Aug. 4, 1881, the shareholders were informed they would shortly be communicated with about the 750 acre option, which cannot fail to be a source of a large profit. At the statutory general meeting of Aug. 27, 1881, we were led to believe the period of the option would be extended to enable the property to be inspected, and by circular of Dec. 9 last it was stated that an extension to May 1 last had been arranged. Meanwhile, in March of this year, actions in a court of law were instituted and discussed at the company's meetings then held and reported. A fortnight later shareholders received a report and plan of the property, and now one would naturally expect the directors to consult the shareholders regarding the option. But not so, though the additional pressing outcry was merely 180*l.* per annum, the ordinary wisdom of the directorate considered it madness to act in the matter with actions which threatened the existence of the company pending. Thereon the vendor alters his terms, and by circular of 6th ult. the secretary states—"that the directors, after a lengthened negotiation with regard to the purchase of the adjoining 750 acres, and taking all circumstances into consideration, have come to the conclusion not to recommend its acquisition by this company."

Queries.—(1). Have the combined shareholders a good case against the vendor for damages resulting from a blundering prospectus and the consequent loss of the option?—(2). Were the directors legally as they were equitably bound to consult with the shareholders before accepting the offer contained in the option, or rejecting it for a sum of 5000*l.* in shares of any company that may be formed for working the 750 acres?—(3). Terms the vendor's behaviour to the company who bore all the brunt, and discovered to him and the public the value of his property?—*Kirkcaldy, Oct. 9.* P.

#### COPPER SMELTERS' PROFITS.

SIR,—In last week's Journal Messrs. Watson Brothers gave an article on the above subject, but I think it would have been more to the point if they had taken their figures from reports in your valuable paper; thus we read that at the last Cornish sale ore averaging 8½ per cent. fetched equal to 74*l.* 14*s.* per ton of fine copper contained; this ore being at Cornish mines the smelters have to pay 6*s.* or 8*s.* per ton of ore for carriage and freight to their works at Swansea or Liverpool, equal to (say) 3*l.* 12*s.* per ton of copper contained; (as it takes about 12 tons of ore to produce 1 ton of copper) so smelters give 78*l.* 6*s.* per ton of copper in Cornish ores, 8½ per cent. when delivered to their works. We read in your paper that price of tough ingot copper was 75*l.* 10*s.*, which price includes delivery at consumer's works, or f.o.b. export ships and broker's commission, so that apparently smelters (lucky dogs) are buying copper at 78*l.* 6*s.* per ton, and selling it at 75*l.* 10*s.*, besides paying for smelting, carriage, and broker's commission. We can thus see what a splendid and lucrative business copper smelting is, and what a grand mistake Cornish miners are making in not smelting their own ores at a works of their own, with Mr. Peter Watson as managing director, and a staff of directors, &c., in London to share in the profits! Joking apart, when Cornish

miners compare prices at Cornish Ticketings with Swansea Ticketings they should remember that carriage from Cornish mines on low produce ore usually amount to 1*s.* or 1*s.* 6*d.* per unit of copper contents, which smelters have to pay beyond what similar ores would cost at Swansea ore wharfs, which are near most of the smelters' works. CUSHI.

#### SPANISH v. CHILIAN COPPER MINES.

SIR,—The following points should be considered, *re* above:—Spanish mines possess enormous deposits of low produce ore, are at no great distance from a market for their ores, and have large contracts with English chemical manufacturers for sale of sulphur in their ores, which thus have a value apart from metal contents, and so are not so much affected as Chilian mines by fluctuations in prices of metals, while Chilian mines have smaller deposits of richer ore, which however is smelted in Chili, where labour and fuel is dear, and also has to bear considerable carriage to a market for the regulus or bar copper; and finally comparing Panulillo with Copiapo I believe the former has a larger extent of ore opened than the latter, which appears dependent on one shaft, where the lode per last report is advised as apparently narrowing in deepest part. Consideration of above points will, I think, show why the public favour Spanish in preference to Chilian mines, and also prefer Panulillo to Copiapo shares, as though return is lower they evidently consider their investment safer.—Oct. 11. CUSHI.

#### RISE IN LEAD.

SIR,—Those interested in lead production and selling are at an early date likely to have their hope, long deferred, satisfactorily realised. A reference to the proceedings at Roman Gravel meeting, reported in last week's Journal, and more particularly to the remarks of Mr. Bewick at that meeting, will bring some comfort to long desponding proprietors of lead shares. It appears that a powerful syndicate is being formed, of which Mr. Bewick is a member and director, and the object of the company is to establish a system of warrant and provide storage for lead exactly on the same principle as now exists with iron, copper, &c. When this is accomplished, which will, probably, be in a few weeks, the public will have the opportunity, no doubt, of buying and dealing readily in lead warrants, and consequently as a set-off to the mischievous pranks of that merciless animal, the "bear," who sells first what he has not got, then beats down the helpless mine, which requires funds for weekly expenditure, we shall soon see the bold attacks of the intrepid "bull." If the statement of the Times that the reserve stock of lead in public hands is only 20,000 tons, or in value about 248,000*l.*—a trifle, certainly, for the world's gigantic requirements—be true, our poor, despised lead shares, selling at miserable prices, will commence an excelsior movement not readily stopped. EXPECTANS. Sheffield, Oct. 12.

#### THE DIVINING ROD.

The following letters have been addressed to the Editor of the Times:—

SIR,—Your article in the Times to-day leads me to address a few lines to you on this subject.

It is idle merely to affirm or deny, as many do, the existence of some unexplained force either in the diviner or the rod. The affirmation may be provable, the negative cannot be, and hence one fact is worth a thousand theories.

A great deal of sarcasm has been directed to the instrument used, a poor unoffending hazel twig, which will, when its action is understood, probably be found to be in its isolated state as innocent of any proclivity towards metals or mineral veins as a solitary piece of zinc is of affinity with the electric fluid.

The experiments conducted for a long period by Mr. Robert Were Fox, and for a more extended period by Mr. W. J. Henwood, established the fact that all mineral veins are conductors of electricity, and that they are constantly traversed by that subtle fluid.

It seems clear from the instance cited by you and from others that but few people are sufficiently sensitive to use the divining rod effectively, the proportion being probably only one or two in 100.

It has been proved that in the hands of such an one the hazel twig he carries bends downwards in a particular way on a lode crossed by him, and it remains to ask what is the only (as I contend) rational theory or explanation of the matter, assuming, as has been the case, that on opening the ground mineral has been discovered at the spot indicated. First, that the person is electrically more sensitive than most of his fellows. Next, that the mineral vein being positively electrified, that is—not only containing a larger portion of electricity than the surrounding atmosphere, but a much larger proportion than the unchannelled strata through which the lodes run, as proved by the experiments of Messrs. Fox and Henwood, the moment the diviner approaches this unseen but powerful current of electricity passing beneath him he becomes instantly, not only the prepared conductor of the fluid, but a thoroughly charged receiver, the overflow of which passes through his outstretched hands and the hazel twig, the stem of which concentrates the current by which the circuit is completed, and the fluid returns to its source. Is it to be wondered at that the tiny flexible twig should, under the influence of such a force, be deflected towards the earth?

I could, would your space allow, give an instance in proof of the theory advanced, to which, if it is rational, scepticism will have to give way before the light of demonstration, as in these days men refuse to disbelieve simply because they cannot, as yet, fully explain all the arcana of Nature. GEO. J. GRAY.

St. Clement's House, Clement's-lane, Oct. 6.

SIR,—In relation to the interesting article on the divining rod, which appeared in the Times of the 6th inst., perhaps the following incident, which occurred within my own experience, may be deemed pertinent.

About 30 years ago I purchased a plot of land on a hill slope two acres in extent, whereon to erect a residence of considerable value. It formed part of an estate laid out for building purposes in a suburb to Newport, Monmouthshire. The absence of waterworks necessitated the holder of each plot who intended building thereon to sink a well for his water supply. Having chosen the site for my residence the architect fixed upon the most convenient spot for the first requisite—the well.

After the well-sinkers had reached a depth of 51 ft. they decided, from the nature of the strata, &c., that it would be perfectly useless to proceed further with the sinking, as the search for water in that direction would be sure to end in failure.

A consultation of all the "knowing ones" in the matter was therefore held, with the result that, owing to the peculiar dip of the land and for various other reasons, "they did not consider there was the least possible chance of water being obtained on the plot of land anywhere." In this dilemma the foreman of the masons, a native of Devon or Cornwall—I forget which—exclaimed "Why don't you try the divining rod?" In the part of country I come from no one would think of sinking a well without the guidance of the rod." Although quite incredulous, I replied that I should only be too glad to have it tried if he knew anyone who could use it. Upon which he said his little boy, 11 years old, possessed the power in a remarkable degree, and if water was to be obtained on the plot he would pledge his character that his boy would find it. The lad, an honest, innocent, and nice-looking little fellow, being sent for and informed what was required of him, immediately repaired to a neighbouring hedge and returned with a rod of blackthorn or hazel—I think the former—about 2 ft. 3 in. in length, and of the thickness of telegraph wire. Then placing the ends of the rod between the thumb and forefinger of each hand, bending it slightly and holding it before him at a short distance from the ground he started on his expedition, I and others following him, and watching every movement closely. After going up and down, crossing and re-crossing the ground several times, but never on the same lines, the lad stopped, and, to our great surprise, we saw the rod exhibit signs of motion, the fingers and thumbs being perfectly motionless. The motion or trembling of the rod increasing it slowly began to revolve, then at an accelerated pace, fairly twisting itself to such an extent that the lad, although he tried his best to retain it, was obliged to let it go, and it fled to some distance. The experiment being thus far successful, coupled with the respect-



ability of the parents, members of a religious body, the lad's transparent innocence, and the father's positive assurance that the operation might be immediately commenced with the certainty of success, the next day saw the well-sinkers in full swing on the spot indicated, and on reaching the depth of 48 ft. they had the gratification of striking on a strong spring of pure and beautiful water coming in so fast as to cause them to make a hurried exit, and in a few hours the well contained a depth of 10 ft. of water, rising since occasionally to 15 ft., and so it now continues. The father stated that when he was a boy he possessed the same power, but entirely lost it at 16 years of age. I send you this incident for what it may be worth. To myself personally its results were most important, as it changed the position of my residence, and secured me an exhaustless supply of beautiful water. I was then, and I am now, fully convinced of the total absence of any deceit or collusion and of the full integrity of the whole transaction, no fee or reward being asked for or expected, and I therefore cannot avoid entertaining the opinion that there must be "something in it," that something being dependent upon some peculiar magnetic or other condition of the human agent employed, and it may yet form one of the grand discoveries of this or some future age.

E. VAUGHAN JENKINS.

Royal Well-terrace, Cheltenham, Oct. 7.

## THE ROCK-DRILL CONTEST IN CORNWALL.

SIR,—I have been expecting to see in the Journal an official report of the Rock-Drill Contest at the Royal Cornwall Polytechnic Jubilee Exhibition; but as none has so far appeared, I should feel greatly obliged if you would kindly allow me to make a few remarks on the results of the trial, as the accounts published so far are calculated to give anything but a fair and impartial comparison of the working of the different drills, especially as far as the Excelsior is concerned. In the first day's competition it appears this drill bored 27½ in. in 10 minutes, which on the face of it would make it appear that it was behind the other competing drills. But according to No. 5 of the printed rules, provided for the occasion, it is stated that after boring the cubical contents out will be measured by pouring water into the hole or by some other method. This was done, and in consequence of the hole bored by the Excelsior drill being so much larger than any of the others it held several cubic inches of water more than any other hole, and taking into consideration that the cylinder was of a smaller diameter than any other drill except the Eclipse, the result of the first day's competition taken by itself would have placed the Excelsior at least on any equality with the best competing drill. Without an explanation the performance of the Excelsior in the second day's trial seems anything but satisfactory, or to have borne out the promise of the day previous. It is stated in the report that it bored 4½ in. in 10 minutes 7 seconds. As has before been mentioned, the tinstone was full of crevices and cracks, and though the man in charge of the drill objected to commencing in the place allotted to him, on account of the unfavourable nature of the stone there, he was obliged to do so.

The consequence was that after drilling about a couple of minutes and penetrating over 4 in., the drill jammed in one of the fissures running diagonally and opened it, and ultimately broke the stone in two. As it was impossible for this or any other drill to bore under the circumstances, especially with the chisel pointed bit, he wished to be allowed to commence a fresh hole where the rock was solid, but was not allowed to do so, and had to fill his 10 minutes up as best he could. It is stated in one account, referring to the time occupied, that it included two long stoppages, and the stone broke; in point of fact the total time that the drill was actually boring was not above three or four minutes, and not half an inch was bored after the first two minutes before the drill jammed. An Occasional Correspondent in your issue of Sept. 23 commenting on the Excelsior places it as second in the order of merit, and observes that in consequence of the compressed air being cut off at half the stroke the blow is necessarily somewhat feeble. Now, I quite agree with him that a drill with a valve of equal piston area, and same length of stroke, if worked with the full pressure of air upon the piston for the whole of that stroke will strike heavier, blow for blow, than a valveless drill working expansively as the Excelsior does cutting the air off at half the stroke; but he must remember, at the same time, that in the latter case, only half a cylinder full of compressed air is used each stroke, against twice that quantity in drills of the valve type, whilst the advantage in force of blow for the valve machine, is only as six to five, and as the valveless type of drills have a quicker stroke than valve machines this advantage in force of blow is more than counterbalanced as proved in the first day's contest. The great advantage claimed for the Excelsior drill, is its simplicity, cheapness, and non-liability to derangement, for as it has only one moving part—the piston—it is almost impossible to get out of order, and the cost of repairs and delay through stoppages are much in its favour, and if, as was proved during the first day's contest, a machine without a valve can be constructed to drill as efficiently as one without the complication, the balance of advantage is certainly in favour of the simpler and cheaper machine. The force of blow depends quite as much upon the length of stroke as upon the diameter of cylinder, and it is the intention of the makers to lengthen the stroke, and consequently strengthen the blow in those machines intended for use in very hard work. I do not wish to find fault with the arrangements for this trial, as I know how impossible it is to please everybody, and I hope to have an opportunity next year of demonstrating what I firmly believe to be the case, that a valveless drill can be made to drill as quickly or quicker, even minute by minute, than one of the more expensive and complicated type; but at the same time I would respectfully suggest to the committee that each competitor should in future be placed strictly on the same footing, that the same number of men should be allowed to work each machine, and above all that a solid stone should be selected for the trial in which every drill would have a fair opportunity of showing its capabilities for boring.—*Minera*, Oct. 10.

G. F. WYNE.

## ROCK-DRILL COMPETITION.

SIR,—We have read the long letter of "Occasional Correspondent" in the Journal of Oct. 7, and note that in this as well as his former epistle a considerable portion of it is devoted to prove that the writer has no connection with either of the drills which took part in this important contest. We know how to estimate the truth of all this, and doubtless your readers will take it for what it is worth. To show his entire disinterestedness he says, "Having given the palm to the Eclipse I went on to describe and point out the weak points of the other drills, with a view that their weaknesses might be remedied." This is, indeed, very kind on his part, but surely "Occasional Correspondent" is not so weak himself as to think that the Eclipse drill is perfection, and if not why not put it through the same ordeal? Referring to the state of the bits, he says it is true the corner of our first bit broke off, but that the second was nearly as good at the finishing as it was to begin. This needs correction; the three corners of our first bit were broken completely off, and the second was worn back more than ½ in.; in fact without exception the Cornish bits were in a far worse state than any others on the ground, plainly proving how much we profited by any previous trial. "Occasional Correspondent" forgets that for two days previous to the contest each drillmaker was again and again trying his bits on the greenstone so as to get the exact temper, and after the world-wide experience that the Eclipse people have had no one for a moment would suppose that they did not know how to temper a bit.

"Occasional Correspondent" lays great stress on the fact that the Cornish drill did not run for ten minutes in the greenstone. Now, being so well posted up in detail we should have given him credit for knowing that the ten minutes was simply proposed by one of the judges as a limit in consequence of the engine driving the air-compressor being wanted at the Polytechnic Hall. Certainly it must have been very vexatious for him to find that the Cornish drill bored almost as deep in 5 min. 20 sec. as his pet machine did in 10 min., and that, too, without using anything like the same quantity of compressed air; but why he, as the champion of the Eclipse, should be so anxious to call public attention to the efficiency of the Cornish drill we are at a loss to conceive. It almost leads us to give him credit for impartiality did he not immediately proceed to make so many misleading statements. First, the changing of

bits. In no case of a hand-fed machine did the workers of that machine effect the change of bits without assistance, and certainly that help did not come from the labourers supplying the water, consequently there must have been a third party. As the Eclipse drill worked automatically extra assistance was not required; but no practical men would think better of the Eclipse because of its automatic feed, and we doubt very much if "Occasional Correspondent" can name any mine in this country where it is now working, it has been tried, but found utterly useless.

Then again his statement re the two Cornish drills at East Pool is altogether incorrect. We have not nor ever had two drills in that mine. He also wishes to insinuate that the Eclipse has been adopted in preference. This is indeed news, but we question his authority for saying so. With regard to our machine coming completely to grief, the repair was simply a matter of two or three hours, and it was in working trim again; but as the end was a very important one, and there was no other machine to take its place except one on the mine belonging to the Eclipse agent, it was sent down.

"Occasional Correspondent" professes to be impartial. He wishes to find out the best machine. If sincere in his desire he should have extended his enquiries; gone to Dolcoath for instance. There he would find that about two years ago the Eclipse parties supplied a machine, but up to the present, in consequence of breakage of the cylinder, disarrangement of that masterpiece of mechanical ingenuity, the greatest wonder of the age, or whatever other term you may apply to the Eclipse valve—we call it the consumptive valve because it consumes so much air in working—going to and from London for sundry repairs, &c., that machine has not worked 25 per cent. of the time. At Tincroft, where the Cornish drill has been tested for the last nine months, on making enquiries he would find that not a single cylinder has broken, not a piston replaced, junked, or even rings put on; not a feed screw worn out, and the same tappet and valve is in the machine that beat the Eclipse drill in the Dolcoath contest in December, 1881. And to prove that the machines are in first-class condition we have only to say that during the past month they drove with two machines 14 fms. 3 ft., in ground averaging from 20½ to 25½ per fathom. In no instance since the Cornish drill has been on the mine have they driven less than 12 fms., whereas when the Eclipse was worked in this mine they never in the same levels drove even the lesser quantity.

We will conclude by informing your readers that "Occasional Correspondent's" remarks comparing the wear of our tappet to the action of water on a stone, is copied verbatim from a testimonial in Messrs. Hathorn and Co.'s catalogue.

Camborne Foundry and Engine Works.

HOLMAN BROS.

## ROCK-DRILL CONTEST.

SIR,—I notice in last week's Journal that "Occasional Correspondent" and Messrs. Hathorn and Co. do not deny what I asserted (in self-defence) that the Eclipse valve consumed more compressed air and did less work than the Cornish. That being acknowledged it will be plainly seen that I have not tried to impose upon the engineering and mining public, but merely prevented Occasional Correspondent from doing so. I beg to inform Messrs. Hathorn and Co. that what I have been forced to state has not been done on my part with any spleen, as I did not throw the first stone, and people who live in glass houses should be careful where they throw their stones. With regard to the little fable which Messrs. Hathorn and Co. quote I think the cap does fit me, but in the following manner:—Previous to the Cornish drill being in existence I adopted the Eclipse to carry out my contract in Cornwall, and when I put it to work I found that it began to thaw—that is, I was not able to accomplish the work with it which I had expected without going to heavy expenses in constant alteration to suit it to the work. With regard to the Reliance compressor, it was so reliable that the one I had, and represented to drive four drills, was only able to drive one. I should have been satisfied if it could have driven two drills, but that was utterly impossible. I, therefore, consider that I have been very severely bitten with the serpent.

J. MCCULLOCH.

## PROSPECTS OF CORNISH COPPER MINING.

SIR,—The yield of the mines of Cornwall is unparalleled in the annals of copper mining. The apathy on the part of the public towards mining for this metal is extraordinary, when it is known that within the last four months the price of copper ores has advanced fully 50 per cent. I well remember the excitement about three years since when a progressive advance in the price of tin had set in. The metal was then somewhere about 65½ per ton; it is now 107½ per ton, while the leading mines have in the meantime gradually enhanced in market value to an extent beyond the calculation of the most sanguine—suffice it to name some three or four out of many. Dolcoath, 400 per cent.; East Pool, 600 per cent.; West Wheal Grenville, 300 per cent.; while Cook's Kitchen may be calculated by the thousand, having risen from 2½ to 42½ per share, over 2000 per cent., a profit quite good enough for any one. I venture to assert that we are on the eve of such a rise on the market value of copper mines as will again revive the brilliant era of Cornish copper mining of bye-gone days, and those who embraced the earliest opportunity will have the greatest reason to be pleased. It would be invidious on my part to name any particular mine or mines—suffice it to say there are several. I will state two instances from a list I have now before me. I see one mine paying costs with copper 10s. per unit, selling at a market price of 10,000— the plant on it being worth fully that amount, no liabilities beyond its current cost, with management seen, and allowed by the whole county to be second to none. Surely with copper at its present price of 15s. per unit (or an advance of 50 per cent.) it does not require much of a genius to predict the early future of this property, especially in the face of a still rising copper market. Another mine in the shallow ground selling about 400½ worth per month, the same quantity now represents 600½, a little more than paying its costs, with mine improving. The market value of this mine I see is about 6000½—chances here also speak for themselves. I can enumerate several mines in the same category which will (Phoenix like) rise out of their own ashes, stimulated by the advanced price of one of the greatest staple commodities of the country.—*St. Day, Cornwall*, Oct. 11.

CHAS. BAWDEN.

## MONTROSE SLATE QUARRIES COMPANY.

SIR,—Can any of your readers give me information about this company? I have written several times to the late secretary, Mr. L. Bishop, for information, and the only reply I get is that the Duke of Montrose seized the property of the company for rent. No further information is vouchsafed to me. I am an unfortunate debenture holder, and should like to hear if any shareholder or debenture holder has had particulars of the company's difficulties. I consider that our directors should give the shareholders some explanation.

Worthing, Oct. 9.

WM. BRADSHAW, M.D.

## MOUNTS BAY CONSOLS.

SIR,—Since I commenced to invest in Cornish mining I have as a matter of course carefully read the Journal. Presuming my co-shareholders do the same, I shall feel obliged if you will insert the following report on the above-named mine. It is from a Cornishman of over 20 years' underground experience, and was made at the request of his son, living in London, a large shareholder. What makes it especially valuable, in my opinion, is the fact of his previously having had a violent prejudice against the property, and he never ceased advising his son to get rid of his shares at almost any sacrifice. The report was made after a two days' examination of the mine.

Oct. 12.

AN ORIGINAL SHAREHOLDER.

MOUNTS BAY CONSOLS.—No. 1 Champion Lode: I have seen this lode over half a mile, the lode can be seen for a mile. In No. 1 shaft and the levels the lode is from 2 to 3 ft. wide, worth 10½ per fathom; average samples from 58 lbs. to 84 lbs. per ton, or 4s. to 8s. per barrow. In No. 2 shaft this lode at 27 fathoms is over 6 ft. wide, worth 8½ per fathom, or about 3s. per barrow. Further west there is about 100 fathoms laid open, which will be worth about 4½ per fathom; I think this lode will average in value over 5½ per fathom. There is another lode crossing this which will also produce good tinstuff. The No. 1 lode is a mine of itself. No. 2 lode is a strong one, and worth 35 lbs. of tin to the ton of stuff, and can be worked at half tribute, or 6½ per fathom. No. 4 lode 2½ ft. wide, about 20 lbs. of tin per ton, worth 5½ per fathom. No. 5 lode 1½ ft. wide, about 28 lbs. tin to the ton, worth 3½ to 4½ per fathom. No. 6 lode worth about 2½ to 3½ per fathom. No. 7 lode 2 ft. wide, worth 4½ per fathom. Hen's Roost lode 3 to

3½ ft. wide, worth fully 6½ per fathom. The new engine-shaft is sinking by six men; the branches will produce tinstuff. There is plenty of tinstuff at surface waiting the erection of stamps. In Sydney Cove copper part, on the south lode, four stopes are working a little below the 20. No. 1 stope is worth about 1 ton of copper per fathom, or 3½ per fathom. In two others about ½ ton of good copper, worth about 5½ per fathom. The other stopes not much worked on. On Browne's lode, in the 10, it has made tin east of the cross-course, and at this point I saw some good stones of tin, worth from 3½ to 5½ per fathom. In the 20 they have had some good branches of copper, but they are not far enough east to cut the cross-course and get under the tin ground, but they are driving to that point. The tin lodes are much better than I expected to see—they are strong lodes. I think the company are sure to have a good mine, all they are waiting for is the stamps to go to work. The copper lodes are looking very prosperous. On Tuesday I was all over the mine at surface, and on Wednesday underground.—*J. B.*

## PARYS COPPER.

SIR,—I think I saw it stated some time ago in the *Mining Journal* by Messrs. Watson Brothers that when the copper unit rose to 15 that it would pay to treat the halvans at Parys. Now that the unit has risen to that figure shareholders would like to know if anything is likely to be done soon. Perhaps Messrs. Watson Brothers, who are always courteous in answering questions, will kindly inform.—*A.*

Newcastle, Oct. 10.

## THE TREWITTEN MINING COMPANY.

SIR,—I enclose a copy of the last report from our manager, Capt. Charles Holman, which may be of interest to your readers, by showing the rapid development of the property, the company having commenced work in October, 1881, less than 12 months since.

London, Oct. 7.

ALFRED E. JARVIS, Sec.

Liskeard, Oct. 4.—Following my report of April 23, I have the pleasure to state that considerable progress has been made in the interval. The pumping engine in course of erection at that date was started early in June, and has worked well ever since. The engine-shaft is now 13 fms. from surface, several fathoms of ground on this shaft has been very difficult to sink, but I am glad to say we have now touched the north part of the lode, and after sinking through it we shall turn the shaft on its course, when we shall be able to sink with much less trouble. The underlay or drawing shaft is also sunk about 13 fms. from the surface, and has been worth for tin for the last 8 fms. 20½ per fathom. At this depth we have started to drive two levels on the course of the lode, east and west of the shaft; the eastern level is driven about 5 fms. The lode produces just the same quantity of tin per fathom as the shaft, but is much larger in the level, being over 10 ft. wide. In driving west, I found the lode thrown south about 6 ft. by a cross-course; I have driven through it, and find it to be about 5 ft. wide, and worth 15½ per fathom. I have no doubt as I get away from the influence of the cross-course, it will improve in size and value. I may say, in conclusion, that if the mine continues to improve as rapidly in the future as within the past few months we shall soon be able to make returns.—*CHARLES HOLMAN.*

## SHROPSHIRE LEAD MINES DISTRICT.

SIR,—The large number of mining engineers and capitalists who attended the annual meetings at Tankerville Great Consols and Roman Gravels last week speak volumes to me for the future of this grand old Silurian district, where the lodes continue in length and depth to produce rich galena. The Tankerville Great Consols Company has taken the right step, and at the right time, by agreeing to raise 27,500£ fresh capital to develop their mines and fix boring and dressing machinery. Now that their other capital is gone their mines are just in a state that very many good mines are left, to starve for want of an united effort amongst the company to open out the mines after they are drained of water, shafts and levels timbered, &c. We were expecting to have heard something about the reworking of the smelting works at Pontesford.

MINER.

## WEST CARADON MINE.

SIR,—Those who have watched the progress of this mine since it was started 2½ years ago, and have retained their interest in it, may now be congratulated upon the result obtained. It promises to be a great mine. The rise on Gilpin's lode is turning out ore worth 9½ to 10s. per ton, or 30½ per fathom. Heavy samplings will now be made. This is from the adit upwards; below the adit a winze is being sunk down to the 17 fm. level, at present worth 2 tons per fathom of rich ore, and it will be evident that a fine mine is in store, as levels are being driven in the 27 and 38, to bring them up under this body of ore. Western Gomanen sett, which has been acquired, and immediately contiguous to West Caradon, promises to be of great value, and a splendid lode has been just laid open; the two mines will be worked together. Too much credit cannot be given to Capt. Richards, as the mine is fulfilling all that he promised when it was started. There are no expenses for pumping machinery, all the levels being drained by South Caradon. It has been long evident that the lodes they are now opening have been missed by the old miners in West Caradon, and it is not too much to say that in West Caradon and New West Caradon there are two of the finest speculations of the day; if, indeed, it is a speculation, when, to all appearance, no more calls will be required.—*Liskeard*, Oct. 12.

J. R.

## THE CARADON DISTRICT.

SIR,—I wish through the Journal to call the attention of the adventurers in some of the copper mines in this district to the fact that it is the opinion of competent judges that if they were to sink deeper they would at no very greater depth reach tin. It is well known (especially to those adventurers who have been paying calls so long in some of them) that explorations for several years have been unsuccessful in finding copper in paying quantities, notably East Caradon, which has been making calls for the last 10 years. It is true the calls are now small, but they may go on for the next 10 years with no better result. Now if the shareholders in East Caradon, at the next meeting shortly to be held, will pay attention to this very important fact, and urge the committee to stop all further searches for copper and sink for tin, they will do themselves and their fellow adventurers good service, and in due time perhaps see the shares at a high premium. The district is acknowledged by all mining authorities to be about the richest in Cornwall, and if the shareholders are apathetic (as is too often the case) they have only themselves to blame if they get no return for their capital.

Newcastle Oct. 10.

## SILVER AT CALLINGTON.

SIR,—I am much pleased with the instructive observations of your various correspondents respecting the recent discovery of silver at Callington. Every one knows that there was a splendid course of silver in the Well lode at Wheal Fortune a few years ago, and silver will again be raised in large quantities, in a few weeks, from the Brothers lode at Bennett's shaft. Thus both lodes, in this fortunate spot, may be called Nature's favourites. At Wheal Langford, on the other hand, good results are confidently expected by those who are initiated in the underground mysteries. In reference to these remarkable lodes, which are termed proper silver lodes, because there is not much lead in them, I will merely mention that they are not quite parallel, but are supposed to meet in the Prince of Wales sett, and that good results might reasonably be expected at the point of contact.

In reference to silver lodes generally a friend of mine, who once lived in South America, informed me that before he went there native silver, mixed with horn and ruby, was so abundant in the rock in Chili and Potosi, that it was found in the shape of leaves, wire, plates, and branches of every imaginable shape—in fact, very much like the native copper in Lake Superior. But to go back to our own Callington deposits, I will merely mention in conclusion that the late Mr. Percival Johnson, F.G.S., told me that one of the levels in Wheal Brothers was once worth something like 5000½ per fathom. Further east, on the other side of the Tamar, a fine bunch of gossan, copper, cobalt, and wire silver was once found.

AN OLD AMATEUR.

[For remainder of Original Correspondence see Journal.]

THE YORKSHIRE LEAD MINES (Limited).—We understand that a very satisfactory report has just been received from the agent in charge of these mines regarding the progress of operations which have been going forward during the past 15 months, from which it is evident that important results are near at hand. The report (which will probably appear in our next week's Journal) concludes—"We are continuing to push on all our operations with energy and vigour



with the view of making early returns of lead ore; and the engineer forwarding the same adds—"That these mines cannot fail to be source of profit and advantage to all who are or may become interested in them." Considering the extent and character of these mines, their inexhaustible resources, and that experts certify that the ore can be worked at a profit of 50 per cent., the prospects are of an exceedingly encouraging character to the proprietors. The shares, 17. each fully paid, at par are worth the attention of investors.

#### REPORT FROM CORNWALL.

Oct. 12.—Almost all that can wisely be said in reference to the tin standards is that well nigh all authorities agree there ought to be an advance without much more delay, and that this belief has taken practical shape in Cornwall by an improved, though fluctuating, demand for mining shares. Of course, this is to some extent the result of the very remarkable improvement in the copper standards at the last Redruth Ticketing—there is always a certain amount of sympathy between mines of various classes—but, nevertheless, it is curious to note, as an evidence of the greater steadiness with which operations are conducted now, and the closeness with which for the most part the mines have been followed in the market, that the consequent advance in the mines specially affected have not by any means been so pronounced as it would have been three or four years since. No doubt there are various other ways of accounting for this; but the fact is worth noting, and it does not seem to us altogether unsatisfactory. The steadier mining can be brought the better. The remark, indeed, is almost a truism, but it will bear repetition for all that.

It does not, indeed, savour much of wisdom or of steadiness either to see the increasing extent to which speculative bids for dividends, and to which time bargains in shares, are carried on in certain quarters. The speculative element, as apart from the investing, will, it would seem have vent somehow, and if it withdraws to a certain extent from the ordinary buying and selling finds its way with little difficulty into more ungenial fashions. Dividend speculation is, however, as a rule a risky business, and the speculators have been a little bitten now and then of late. With regard to East Pool, they have been somewhat more successful; but, in any case the practice is to be strongly deprecated. It has led more than once to the declaration of a larger dividend than circumstances could justify. East Pool is strong enough at present to resist such a pressure, but it may not always be so. We are glad to see the down-right way in which Capt. Bishop repudiated the idea of working East Pool or any other mine for market purposes. That is the only way to ensure, as far as foresight can do so, continued success. And while the speculators for the drop have been right about the dividend, it is not at all clear that those who have agreed to sell at the end of the year for 53½ will find themselves equally lucky. The forecasts at the account were very guarded, but they certainly do not point in that direction.

Another proof has been given of the large extent to which so-called "accidents" are no accidents at all, by the death of a miner at Dolcoath in consequence of riding on a skip. Not only is it thoroughly well-known that this is forbidden, but only in the previous week men had been discharged for breaking the rule; yet a party of them rode in the skip as usual, one is killed, and the others, conscience stricken and afraid of the consequences, run away. Three "accidents" out of every four are of this class; but it is difficult to see what stronger measure can be adopted to put an end to them.

Capt. Teague, jun., is developing an amount of inventive ability which does him every credit, and which is likely to result in very important gains in various directions in the conduct of mining operations. Most of his inventions have been illustrated at recent exhibitions, but he is still adding new. At East Pool account Captain Bishop, in proposing the "Neighbouring Mines," referred to the patent air-compressor improvements of Capt. Teague, and said that in his opinion the valve was the best now working in the county. He also spoke highly of Mr. Teague's other inventions, and believed the economiser was destined to become generally adopted in the county. Capt. Teague, in reply, said the economiser was very useful, and he believed that in time it would be adopted in every mine in the county, because it prevented the waste of air. The economiser bottled up the air in a receiver, and when it was required it would go out of its own accord, the inlet valve being self-acting. But he felt proud to be able to tell them that he had made a much greater discovery than the inlet valve, and that was in regard to the outlet valve. Of late frequent reference had been made to the falling off in the duty of Cornish engines. He had discovered what he believed was a remedy. They would be surprised when he told them that the air-compressor at East Pool Mine was pressing 800 lbs. each stroke—50 strokes per minute—and he need not remind them of the great waste of power which resulted from it. To prevent this he had designed a balance valve that would open with little or no pressure, and thereby compressed air could be used as a motive power, or for any other purpose without the heavy loss involved by the present system. The same would apply to their pumping-engines, and it would prevent the falling off in the duty to which he had already referred. The reflection had been on the makers of the engines, but the fact was the people reporting their duty had not called attention to the loss of power as they should have done.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Oct. 12.—Mr. Fisher Smith, agent for the Earl of Dudley, has issued a circular stating that the prices of coal per statute ton at the collieries will now be as follows:—East of Dudley—Thick coal: Furnace, 11s.; forge, 10s.; steam, 10s.; engine slack, 5s. 6d.; Ramrod Hall forge slack, 3d. per ton less than above. Heathen coal: Forge, 11s.; engine slack, 5s. 6d. New Mine coal, 10s. 6d.; engine slack, 5s. 6d.—West of Dudley—Thick and Heathen coal: Best household, 14s.; furnace, 10s. 6d.; steam, 9s.; bright screenings, 9s.; steam screenings, 8s. 6d.; engine slack, Himley best, 5s.; ditto, ordinary, 4s. 6d.

These new prices are an advance, as to furnace coal of 1s. per ton, and this rise Mr. Fisher Smith has been enabled to declare by having given the colliers a rise of 2d. "per day," or stint, in the Thin coal seams, and 4d. "per day," or stint, in the Thick coal seams; in other words, a rise of 10 per cent. Wages are now 2s. 10d. per stint in the Thin seams, and 3s. 8d. in the Thick. Of course, this advance has ended the strike, since all the South Staffordshire colliers will receive it, and the pits are now all again running. Mr. Smith has also issued a circular advancing the prices of his lordship's limestone at the quarries. The new prices are:—Grey crystalline for blast-furnace purposes, 4s. 6d. per ton; and blue or thick bed for agricultural and masonry purposes, 4s. 3d. per ton; subject to alteration without notice. An allowance of 1 ton in 20 will for the present be given.

With these advances in raw materials staring them in the face, traders assembled at the Quarterly Meetings in Wolverhampton yesterday and in Birmingham this afternoon. At both gatherings complaints were general that this forcing up of coal prices by the colliers necessitated advances in pig and manufactured iron which the state of the demand did not warrant. This being so, buyers were cautious in operating. At Wolverhampton all mine pig makers quoted 70s. and 72s. 6d. per ton, which is an advance on the quarter of 5s. per ton, and second and third class pigs were also stronger. Marked bars and marked boiler-plates were not to be had except at an advance of 10s. per ton, making bars 8s. and plates 9s. 10s.

At the quarterly meeting of ironmasters in Birmingham to-day best native pigs were advanced 5s., making them 70s.; marked bars and plates advanced 10s., making bars 8s. and plates 9s. 10s.; second and third class manufactured iron advanced between 5s. and 10s. Ordinary sheet makers refused to quote, being crowded with orders. Best thin sheet firms advanced, prices 20s., making singles 14l. Galvanisers advanced sheets 10s., making them 15l. At out-ports Welsh tin-plate makers fixed coxes 17s. per box. Liverpool coal advanced 1s.

At the quarterly meeting of the Tin Plate Trade held at Birmingham

on Thursday, under the presidency of Sir John Jones Jenkins, of the South Wales Works, Llanelly, representatives being present from the leading establishments in the Principality and the Midland districts, it was decided to advance tin plates 1s. per box on the prices hitherto obtained, making ordinary coxes 17s. per box.

An influential meeting of the Galvanised Iron Trade Association was held at the secretary's office, the Birmingham Exchange, on Thursday; Mr. Richard Heathfield (Messrs. Morewood and Co.), the President of the association, occupied the chair. The minutes of the previous meeting of this association having been read and confirmed, considerable discussion took place on the present position of the trade, which was considered very satisfactory. It was decided to fix the present minimum price of 22 and 24 gauge common galvanised iron, in bundles, at 15l. per ton f.o.b. London, with the usual extras, this being an advance of 10s. per ton upon the ruling price during the past quarter. The members present agreed that they would not, for the present, dispose of any hard spelter at a lower price than 12l. per ton, delivered in Liverpool or London.

The South Staffordshire Mines Drainage Commissioners adjourned meeting was held in Wolverhampton on Wednesday. Some discussion took place as to the relative value of the surface and the underground works of the Commission, and it was generally agreed that the surface works ought to be pushed on much more rapidly than at present, so as to lessen the cost of underground pumping. The annual reports of the engineers were received, and it was announced that Mr. Bassano would bring forward his important proposition, referred to last week, at an early meeting.

The North Staffordshire colliery proprietors have received a deputation of the miners' representatives relative to the notice which the men have served for a 10 per cent. rise in wages. The masters informed the deputation that the state of trade did not warrant such a rise; but, nevertheless, they would agree to give it with the understanding that all the notices to the masters are to expire on Saturday.

#### REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Oct. 12.—Turning this week to the south-west border of Montgomeryshire, I may notice that the Glasslyn Mine, near Dyffylle, is about to be restarted. At this mine there is a deposit of copper in a regular vein about 1 ft. wide, selected samples of which undressed assayed 33 per cent. It is just possible this may be an easterly continuation of a part of the Esgair-Ffrith lode. Among the mines standing idle in Cardigan is one I have referred to in former reports Penrhwygerwen, on the roadside between Machynlleth and Aberystwyth. A cross-cut lately driven under the road cut a lode about 12 ft. wide, which contained copper ore that after being budded and dressed assayed 25 per cent. of copper. Operations have been temporarily suspended here owing to the illness and absence of the proprietor, Mr. C. Herbert Stokes, a gentleman who has done much for mines and miners in Cardigan, and who will be welcomed back to renew his mining explorations.

I notice that Mr. G. J. Gray, of Clement's House, a gentleman well known in connection with mines and quarries in Wales, writes to the Times an apology or a defence of the use of the divining-rod, the rationale of which, he explains, is that the electricity, which is considered to be one agent in determining the deposition of metallic ores in cracks as they pass through strata which are good conductors of electricity, is still active, and that a man of the true shade of sensibility—a good medium—walks over a lode containing metallic ores with the divining rod of hazel balanced on his hand, or at the end of a staff, the subtle fluid rushes up, charges the man to overflowing, and passing out at one end of the hazel wand bends it down and goes back into the earth. It is an ingenious theory, and although, as I shall show, it is not quite a new one, Mr. Gray has very fairly and lucidly stated it. Only there are several points requiring explanation. Does the electric fluid still course along mineral veins containing metallic ore? Has anyone either in a mine or above ground felt himself charged with electricity? What particular liking has the subtle fluid for rods of hazel more than twigs of other wood which are also good conductors of it, especially for the root end of the rod? and, finally, is it in accord with what we know that the course of the electricity should be diverted from along the vein into a vertical current going up into the man and out at one end of the hazel and back to the place whence it came. Perhaps my presence as an unbeliever might hinder the desired effect, but I should rather like to see the process tried through several good mediums. There is a fascination about the whole subject, as there is about the theories of the old astrologers; and let me conclude with the charming directions for the use of the rod given by Mr. Gabriel Plattes in his quaint book "A Discovery of Subterranean Treasure," published in 1738 at Horace's Head, Roundcourt, in the Strand:—

"The operation with the *Virgula divina* is thus to be performed: Some observe a set day and hour, with certain words and ceremonies at the cutting up of the same which I have found to be little to the purpose. Thus I wrought about midsummer in a calm morning. I cut up a rod of hazel, all of the same spring's growth, almost a yard long; then I ty'd it to my staff in the middle with a strong thread, so that it did hang even, like the beam of a balance; thus I carried it up and down the mountains where lead grew, and before noon it guided me to the office of a lead mine, which I try'd, having one with me with a hacket of iron and a spade; and within two hours we found a vein of lead ore, within less than a foot of grass. The signs that it sheweth is to bow down the root end towards the earth, as though it would grow there near unto the office of a mine; when you see it does so you must carry it round about the place to see that it turneth in the string still to the same place on which side soever you stand. The reason of this attraction I conceived to be of kin to the load-stone drawing iron to it by a secret virtue, inbred by Nature, and not by any conjuration as some have fondly imagined. And the reason of this my opinion was because that in divers of my practical experiments I have observed an attraction betwixt several things like that of the load-stone and iron; and if it were to good purpose I suppose that I could show more experience of that kind than any man in England."

#### TRADE IN SOUTH WALES.

Oct. 12.—The shipments of coal at the principal South Wales ports for the first nine months of the present year exhibit a healthy increase over the corresponding period of last year. Cardiff sent away (foreign) 4,408,669 tons; Newport, 1,010,127 tons; Swansea, 717,225 tons; and Llanelly, 59,030 tons. Of patent fuel Cardiff exported 126,549 tons; Swansea, 205,750 tons. Of coke: Cardiff, 22,076 tons; Swansea, 7977 tons; Newport, 4794 tons. For the month of September only Cardiff exported 524,635 tons foreign and 81,053 coastwise; Newport, 110,961 tons foreign and 86,668 coastwise; Swansea, 93,453 tons foreign and 67,219 coastwise; Llanelly, 5208 tons foreign and 9921 coastwise. The amount sent away last month was—Cardiff, 126,524 tons foreign and 24,478 coastwise; Newport, 30,974 tons foreign and 18,715 coastwise; Swansea, 15,212 tons foreign and 10,043 coastwise.

The price of coal is firm, with an upward tendency. Good colliery-screened may be obtained at 11s. per ton, but other qualities may be had as low as 8s. 6d., and as high as 12s. 6d. Some of the large steam-packet contracts are now being given out at quotations which are in excess of those of the same period last year. Work is going on steadily here, and there is no cause of complaint, except on the score of dock accommodation.

The shipments of iron in the first nine months of 1882 amounted to 130,838 tons at Newport, 98,501 tons at Cardiff, and only 5699 tons at Swansea. The quantity of iron rails exported in 1882 to the end of September, in the whole country, was only 40,580 tons valued at 258,042l., while steel rails were sent away to the amount of 552,555, valued at 3,661,190l., or nearly thirteen times the quantity of iron rails, while the value is about fourteen times as much. There is no doubt that iron rails will be less and less in demand as time goes on, in consequence of the cheap processes in existence for steel-making. Sir Henry Bessemer and Dr. Siemens did much towards that object, while the Gilchrist-Thomas process tends further in the same direction, and another still cheaper process is reported to be

matured by Mr. Darby, of Ebbw Vale Works, and Mr. Griffiths, of Tredegar, by which steel rails can be purchased at the same price as iron rails.

Tin-plates are now in better demand, and a gleam of sunshine is passing over this unfortunate industry. Coke-makers are from 16s. 6d. to 17s., and charcoal-makers from 19s. 6d. to 21s. We shall find some of the old works being opened in the course of the coming winter.

The Cardiff freighters have resolved to submit two schemes to Parliament for their new dock and railway, the one at Barry Island and the other at the mouth of the Ogmore. The freighters declare themselves determined to carry out one or other of the schemes, and thus place themselves independent of other undertakings. The Taff Vale Railway promised them some concessions in 1877, but they were never made, and now they declare that they come too late.

**NAKED LIGHTS AT THE SOUTH WALES COLLIERY.**—An arbitration was opened on Monday at the Royal Hotel, Cardiff, on the question of the use of naked lights in the South Wales Colliery, Abertillery. The arbitration was ordered by the Government in consequence of the facts of the case being laid before them by Mr. Cadman, Her Majesty's Inspector of Mines for the South Wales district. The colliery was considered by the Home Office as unfit for the use of naked lights, in consequence of an explosion which occurred there on Dec. 18, by which 18 lives were lost. Mr. W. T. Lewis, of Aberdare, acted as arbitrator for the Government; Mr. Forster Brown as arbitrator of the company; while the umpire was Mr. G. B. Forster, of Newcastle-upon-Tyne. The facts of the case are that after the explosion in 1876 locked safety lamps were used in the mine, in consequence of the recommendation of Mr. Cadman. Opinions at the inquest had been in favour of the theory that the explosion was caused by a sudden influx of gas, and therefore, however good the ventilation, Mr. Cadman considered it only a necessary precaution to use safety lamps. The seam worked at this colliery, however, is stated by the men to be a very "dirty" one, and a better light is required to properly work it without inconvenience than is afforded through the gauge of a lamp. The men were, it is stated, for the most part greatly in favour of using naked lights, and applied to the manager to allow them to be used. An application was made towards the end of 1880 to substitute naked lights for lamps; but Mr. Cadman declined to agree to this course, and in August, 1881, the company determined to use the naked lights on their own responsibility. This course has, it is stated, up to the present, which is more than 12 months, been practised without any serious effects, the only case of burning since being a very slight one, the man injured only discontinuing work for a week, and it is one of a class which occurs sometimes at other collieries in which naked lights are used. The colliery has a good character for ventilation, Mr. Cadman in his report speaking highly of it.—Mr. Lawrence appeared for the Government, while Mr. Wright represented the colliery owners.—The case for the colliery company was proceeded with. Mr. W. Adams continued his evidence, and the other witnesses called during the day were Mr. Donald Bain, assistant Inspector of Mines for the district; Mr. Jones, late manager of the colliery, and Mr. Evans. Mr. Bain spoke highly of the ventilation of the colliery, and said that on his last visit it was particularly effective. His opinion did not appear to be strongly against the use of naked lights. There are many witnesses to be examined, among whom are ten or a dozen colliers, some of whom have left the colliery in consequence of the use of the open lights.—*South Wales Daily News.*

#### TRADE OF THE TYNE AND WEAR.

Oct. 11.—There is no change in the position of the steam coal trade north of the Tyne; most of the works are well supplied with orders, and the men are consequently about fully employed. A meeting was held on Saturday of the Sliding Scale Committee, which was well attended by colliery owners, and the workmen were represented by Mr. Burt and other delegates. A proposition on behalf of the men that the sliding scale should be altered from the present basis was submitted to the meeting and discussed for some time. No definite decision was arrived at, and the question was ultimately postponed, and it will again be brought forward at a future meeting. In Durham the works are without exception kept fully going, and the value of most kinds of coal, especially gas, house, and coking coal, is gradually improving. There is, therefore, a prospect of the wages of the miners being advanced when the next quarter's accounts are made up under the sliding scale. The men in some localities continue to restrict the output to some extent; but this movement does not appear to extend, and its effect is not much felt as yet. It appears to be pretty certain that the men in Durham and Northumberland will continue to adhere to the sliding scale, but they will at the same time endeavour to alter or improve the basis on which these scales have been established. During the past month 310,283 tons of coal were sent to London by sea. Out of that total 167,694 tons were sent from Newcastle (more than one half), 83,560 tons from Sunderland, 18,212 tons from Hartlepool, and 12,655 tons from Seaham; total from the north-eastern ports, 282,121 tons, and from the Welsh and Scotch ports 21,900 tons. The North of England has, therefore, complete possession of the London trade so far as sea transport is concerned.

There has been great activity in the Cleveland iron market during the past week. The general improvement in the trade is very marked, and prices are very firm and likely to be further advanced. Makers will now only sell at 45s. for No. 3. The restrictions in the make and the rapid reduction of stocks fully warrant the position. At the present moment it appears to be extremely probable that Cleveland iron will become very scarce shortly; but, of course, it is quite possible that the foreign demand may ere long fall off considerably. That depends, to a great extent, on the state of the weather, the approach of winter, and possible closing of foreign ports by ice. It is remarkable that the manufactured iron trade continues quiet; there is a good enquiry for ship-plates, but the production is very great, and this keeps down prices. The highest price quoted for ship-plates is 6l. 15s., and other iron in proportion. The demand for coal and coke at Middlesbrough is very strong, and the value of all kinds of coal and coke is increasing. The intended amalgamation of the great company of Sir William Armstrong and Co., of Elswick, and the Cleveland Shipbuilding Company of Charles Mitchell and Co., attracts much attention. It appears to be the intention to join the two companies, and to constitute one large limited company. Of course, the very important specialties which have been so long manufactured at Elswick—that is, the manufacture of hydraulic machines, bridges, &c. of all kinds, Armstrong guns, &c.—will be continued, and iron shipbuilding will be continued at Walker—that is, the building of merchant and passenger steamers. But, in addition to this, if the contemplated arrangement is carried out, it is fully expected that iron shipbuilding will be commenced at Elswick. There is sufficient ground in connection with the present works very suitable for the purpose. Should this important undertaking be carried out, it is stated that the building and equipment of war vessels will be chiefly carried on at Elswick, and merchant and passenger steamers, as at present, will be built at Walker, where there is not room for an extension of the works.

The quarterly meeting of the iron trade was held at Middlesbrough on Tuesday. There was a fair attendance, and many strangers from a distance. The market was very firm, but no change of consequence in the quotations from those given above. Messrs. Connal's stock is now 107,395 tons—a reduction of 1533 tons on the week. The shipments of pig-iron continue large. Manufactured iron is still quiet, and the steel trade is not very active. Messrs. Butler Brothers had a good show of steel exhibits by the Siemens process, splendid large steel castings of toothed wheels, tools, and mill and forge work.

The new railway schemes in South Durham continue to attract much attention, and a severe competition is anticipated. One of the schemes is to construct a railway from Skipton, by Richmond, Darlington, and Middlesbrough to South Bank. The second scheme commences at Hellifield, and is called the North Yorkshire and Lancashire Railway; it passes by Grassington and Middleham, and for the present it is proposed that it terminates at Darlington, but there is little doubt that it is intended ultimately to extend it to Teesside and Sunderland. The distance from Hellifield to Darlington is 52 miles; the cost is estimated at 1,250,000l., and the gradients are very easy. A third scheme is pointed out, but whether it is that of the North-Eastern Railway is not very clear. It is certain that there is a county between South Durham and Lancashire that is not well served with railways, and at each end there is a large population, and very large industries. The suggested lines would improve the communication, and reduce the distance between Durham and Lancashire towns by from 20 to 30 miles. The public will wait with interest for the decision of the North Eastern directors, but there is a strong feeling in favour of an additional line from Lancashire



through the Yorkshire dales by Darlington, and on to the Durham ports.

**DISCOVERY OF A COAL SEAM AT CHILTON COLLIERY.**—For some time a staple or small shaft has been in course of sinking at the above colliery, and the Brickwell seam has at length been reached. The thickness of the seam is 5 ft., and the quality of the coal very fine, and there is only a small band in the seam 3 in. in thickness. This newly-discovered seam will now be duly won with all speed by the lessees of Lord Eldon. All the seams of coal known in the Ferryhill district have now been found here from the five-quarter down to the Brickwell seam. The working of this colliery was temporarily suspended in May last, owing to the depression in the house coal trade; but the working of the Harvey seam for house coal, and of the Brickwell seam for coking coal will shortly again be resumed on a large scale. Mr. John Johnson, mining engineer, has directed the late exploring operations.

The North-East Coast Exhibition, which as we have before remarked has proved a great success, will be closed on Saturday. The judges have awarded medals and certificates to the most successful exhibitors in the various sections. There are in all 612 exhibitions and 1888 exhibits, which are valued at 250,000. The outlay attending the addition and alterations to the Aquarium for the purposes of the Exhibition was nearly 12,000. A reserve fund of 6000. was subscribed by local firms; but this fund will not be drawn upon as the receipts already exceed the expenditure, and the excess will be devoted to the founding of scholarships, or to grants in aid of the lifeboat and other institutions connected with navigation on the north-east coast. The experience gained at this Exhibition will we have no doubt lead to other exhibitions. The next naval exhibition on the north-east coast will no doubt be held at Sunderland, where there is as much enterprise, spirit, and industry as in any town in this country, but there is also a necessity for an exhibition on a much larger scale, which should embrace all the productions, manufactures, and industries of the district, and this should be held in Newcastle-on-Tyne. The great benefit to be derived from these exhibitions is the publicity given to new inventions, and the fact that these inventions and improvements are brought by these means under the notice of engineers, manufacturers, &c. We notice that the boiler used for driving the machinery at the Exhibition is constructed on the Fox and Hopkinson principle, with corrugated flues and conical pipes for circulating the water, and during the month it has been at work it has been examined and admired by thousands of visitors. On being opened a few days ago for internal inspection a very remarkable sight was presented which caused much surprise. The water used is very hard, and it forms scale rapidly, but it was found that the scale which had formed on the flues was precipitated to the bottom of the boiler, the corrugated flues having stripped themselves of scale. The general appearance and remarkable result led to a recommendation that this condition of the boiler and deposits of scale should be photographed. Accordingly Mr. Farmer, agent for the Maxim-Weston Electric Light Company, in conjunction with Mr. Paul Stabler, of Sunderland, succeeded in obtaining perfect views of the interior of the boiler. These photographs and the boiler have been examined by numerous scientists, and the whole result is considered a remarkable achievement. The patentees of this boiler claim that their corrugated flues are self-cleaning, and strip themselves of scaly deposit, and it is considered that this is fully established by the result at the Tynemouth Exhibition.

#### FOREIGN MINING AND METALLURGY.

Upon the Paris iron market prices have experienced scarcely any change, merchants' iron still standing at 87. per ton. Refining pig has advanced in consequence of the high rates attained by coke; in the Longwy group this description of pig has brought 27. 16s. per ton. We learn from St. Dizier that the Longwy Steelworks Company will shortly apply the Gilchrist-Thomas system to two or three of its furnaces, and will purchase special minerals in Germany. The Jeuf blast furnaces will also be adapted to the Gilchrist-Thomas system towards the close of this month. The Orleans Railway Company has invited tenders for 16,000 tons of steel rails. Some sensation has been produced by the course taken by the French Minister of Public Works in accepting only some of the tenders recently delivered for material to be delivered to the French State Railways, and in addressing himself to foreign firms for the delivery of the remainder. It does not appear, however, that foreign firms have actually obtained any contract at present. In the German iron trade the current of business has continued very active, as well for pig as for iron. While there is happily no feverish activity, employment is general, the blast furnaces being occupied until the close of the current year, while the forgemasters are also actively engaged. At Strasburg the Hörde Works have taken a contract for a quantity of steel rails and fish-plates at 97. 18s. per ton.

Little or no change has been remarked in the general state of the Belgian iron trade. An upward tendency appears, however, to be becoming more decided as regards pig, while iron has remained stationary. Plates have been very firm. Pig has shown a greater tendency to advance than iron, in consequence of the rise in coal and coke. It would seem that the price of iron must also be advanced, as if foreign masters cannot obtain higher rates, they will find themselves in a position of considerable difficulty, in view of the prices now current for raw materials. English pig has been dealt in at 27. 13s. 3d. per ton, delivered at Antwerp, while Belgian casting pig has been supported with firmness at 37. per ton. The Athus Works require 27. 12s. 6d. per ton for No. 5 pig. At Charleroi the demand for pig has been well maintained, and some of the blast furnaces have their production already engaged for the first three months of 1883 at the rates now current. As regards iron, it can scarcely be said that 57. 12s. per ton is the current basis price. It may be the rate in connection with small current transactions, but there is little doubt that a transaction of serious importance might be readily carried through at 57. 8s. per ton. At the same time, industrials are not disposed to enter upon engagements at this latter price for a long period in advance in presence of the rates current for raw materials. Girders have brought 57. 16s. to 67. per ton. Plates have been very firm, at 77. 12s. per ton, while some of the best works have asked 87. per ton. Boiler-plates have been quoted at 87. 8s. per ton.

The condition of the Belgian coal trade remains very satisfactory, not to say brilliant; indeed, from a metallurgical point of view it may even be said that the situation is a little too brilliant. The demand is considerable for coal of all descriptions, and colliery managers are harassed with orders which they cannot accept, as well as with complaints for the least delay. The demand is so active and stocks are at the same time so much reduced that one or two days' idleness in certain districts would have the effect of compelling many works to stop through sheer want of combustible. Should the winter set in a little sooner than ordinary, and should the customary transport difficulties present themselves, it is very possible that prices may go much higher than they are at present. However, it is useless to speculate too much as to this. The demand for coal appears to be further increasing in Germany, and the general course of the German coal trade is highly favourable. Industrial coal is in much request, and the demand for household descriptions is also beginning to become more decided. The extraction of the mines of the Saarbrück basin in August amounted to 475,488 tons, as compared with 461,701 tons in July. Deliveries by water have shown much activity. Coke has become extremely scarce, and is everywhere in demand. In the Düsseldorf district coal has been well maintained, and some descriptions have even shown a slight upward tendency.

**CALIFORNIA GOLD.**—The latest telegram from the mine indicates that the results of the fifth week of working since the completion of the machinery and the resumption of operations are greater than those of any previous week. The profits for the milling alone on an output of 250 tons are 6407. 25 additional stamps have been put in operation this week. The report dated Sept. 9 is considered to show marked progress throughout the mine: 74 men are already employed in the mine, and the number, with the present prospects of pro-

duction, is likely soon to be increased. A large amount of business has been reported in the shares.

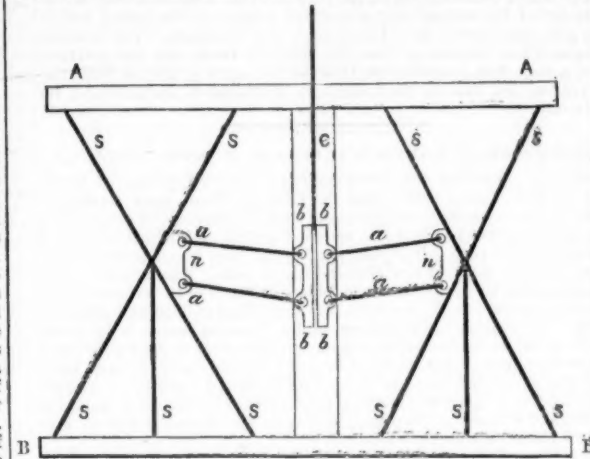
### Lectures on Practical Mining in Germany.

#### CLAUSTHAL MINING SCHOOL NOTES—No. CCIII.\*

BY J. CLARK JEFFERSON, A.R.S.M., WH. 83,  
Mining Engineer, Wakefield.  
(Formerly Student at the Royal Bergakademie, Clausthal.)  
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(c)—**SAFETY CATCHES FOR IRON CONDUCTORS.**—The chief point for consideration in the construction of safety catches for iron conductors lies in the fact that iron conductors are much thinner than wooden conductors, and are liable to become very smooth owing to the rubbing of the guide shoes against them, and the friction is hence much less than in the case of wooden conductors. With these exceptions the arrangements may be similar to those already described. Eccentrics and wedges appear to offer the least difficulties in their application to iron conductors.

**HOPPE'S SAFETY CATCH.**—This safety catch is employed at the Hoppe Pit of the Abendstern Colliery, near Rosditz, in Upper Silesia. The aim of this arrangement is to bring the cage gradually to rest by applying brakes, fixed to the cage, against the conductors. The outline of this arrangement is shown in the accompanying diagram,



in which A A is the upper part of the cage, B B the floor of the cage, S S are tie rods arranged as shown, b b are the breaks which glide on two opposite sides of the T-iron conductor. Each brake piece, b b, is connected by two links, a a, with the [piece, n, fixed to the intersection of the tie rods, S S. The connection of the links, a a, at the ends is by means of pins. With the links, a a, in the position shown in the diagram, the brake pieces, b b, are so far apart that there is sufficient play between them and the conductors. If the brake pieces, b b, are raised they approach each other, the length of the links, a a, being so adjusted that when the brake pieces have been raised within 1 in. of the position in which the links, a a, would be horizontal the brake pieces, b b, press the conductors so firmly that the friction is sufficient to support the cage. Stops are fixed to the sides of the cage to prevent the brake pieces, b b, rising so far that the links, a a, can pass beyond the position in which they would be horizontal. The upper ends of the brake pieces, b b, are connected by pins to a common vertical rod, C, the upper end of the rod, C, being connected to one end of a short lever hinged to the cage, the opposite end of this lever being attached to a coupling chain which connects it with the shackle of the winding rope; this same end of the lever is pressed downwards by a flat spring, which thus tends to raise the opposite end of the lever, and along with it the brake pieces. The winding rope through the above-mentioned coupling chain tends to raise the inner end of the lever, and to depress the outer end and along with it the rod, C, and brake pieces, b b, to such an extent that the space between the brake pieces and the conductor allows for sufficient play. This is the normal condition during winding. In order to prevent the oscillations of the cage, causing the brake pieces to rub against the conductors, guide shoes are fixed to the sides of the cage above and below the brake pieces, b b, the play between the guide shoes and the conductors being slightly less than that between the brake pieces, b b, and the conductors. The adjustment of the length of the links, a a, which is absolutely necessary for the reason above given, is effected by means of a screwed cotter similar to the arrangement used in many locomotive coupling rods. When a rupture of the winding rope occurs the flat spring above mentioned raises the brake pieces, b b, into contact with the conductor, and the resulting friction tends to raise them (i.e., relatively to the cage) still further, causing them to bind more strongly against the conductor. The raising of the brake pieces, b b, tends to bring the links, a a, into an horizontal position, and after both brake pieces, b b, are in contact with the conductors, this can only be done by pushing the [pieces, a a, further apart. The slight extent to which this is necessary is allowed for by the elasticity of the tie rods, S, the tension of the latter resulting in a direct thrust along the links, a a, pressing the brake pieces, b b, against the conductors. The links, a a, must be of the same length and parallel in order that the brake pieces may always be vertical, and hence bear with the whole of their surface on the conductors. The full extent to which each of the [pieces, a a, can be pushed outwards is 1-14th inch. The stoppage of the cage is said in practice to occur within one second after the rupture of the rope. When the cage is at rest on the fallers at the top of the shaft or at the bottom, and the winding rope slack, the brake pieces, b b, are pressed against the sides of the conductor merely with the slight pressure produced by the tension of the spring.

(f)—**SAFETY CATCH FOR WIRE ROPE CONDUCTORS.**—MERRICK'S SAFETY CATCH.—In this arrangement the thimbles for the wire rope are hollowed out in such a manner as to admit a wedge which, when pushed home, leaves the circular opening through which the rope passes considerably smaller in diameter than the rope. The wedge is fixed to the end of the short arm of a bent lever, the end of the other arm being attached by means of a coupling chain to the swivel of the winding rope; the same end is pressed down by a spring, or has a weight attached to it. In normal condition during winding, when the coupling chains are pulled tight, the long arms are horizontal, and the short arms are inclined downwards. When the winding rope breaks the long arms of the levers are depressed by the spring or weight, raising the short arms carrying the wedges nearer to an horizontal position, and hence pushing the wedge closer to the outside of the thimble, tending to close it tight upon the rope; this tendency is still further increased by the friction of the rope against the wedge which raises the latter still further up into the recess in the thimble. With suitably shaped wedges and thimbles most of the arrangements described in the class (C) can be employed for wire rope conductors.

**KING'S SAFETY CATCH FOR WIRE ROPE CONDUCTORS** has the following construction:—At each corner of the top frame of the cage is hinged a bell crank lever, the end of one arm being attached by a coupling chain to the shackle of the winding rope, the end of the opposite arm being bent slightly upwards, and having a hole through it slightly larger than the diameter of the winding rope. A flat spring attached to the top of the cage tends to pull down the end of the lever attached to the coupling chain, raising the opposite end; in its normal position during winding, when the coupling chains are tight, the ends of the levers attached to the coupling chains are

raised, and the opposite arms depressed, the extreme end of the lever which contains the hole through which the winding rope passes being horizontal. When the winding rope breaks the spring depresses, the end of the lever to which it is attached raising the opposite end. The hole through which the wire rope conductor passes is now no longer vertical and parallel to the wire rope conductor, but so much inclined that this end of the lever tends to kink on and hold fast to the wire rope conductors.

In all the arrangements we have described, with the exception of Hoppe's safety catch, the cage on the breaking of the rope is stopped with a more or less sudden jerk. The following arrangement, which has been designed by Von Sparr, and which can be applied to most of the safety catch arrangements we have described, is intended to bring the cage gradually to rest after the breaking of the rope. It consists of a long wrought-iron tube, closed at the lower end with a stuffing box, and filled loosely with hay, straw, or similar material. The tube is about 5 in. in diameter, and from 6 ft. 6 in. to 8 ft. long; a long round iron rod passes down through the centre of the tube and through the stuffing box; the lower end of this rod is attached to the cage, and the upper end to the shackle of the winding rope; near the upper end of the rod and attached to it is a piston which can slide freely within the tube. The lower end of the wrought-iron tube is fixed to a cross bearer or frame of wrought-iron consisting of two [pieces] the ends of this cross frame are formed to slide along the conductor. The cage is also provided with guide shoes to slide along the conductors. To the cross frame is attached any of the suitable safety catches above described. When the winding rope breaks the safety catch fixes the cross frame firmly to the conductor. The cage is, however, free to descend, drawing down with it the above-mentioned rod and piston, the latter compressing the air and hay or other material in the wrought-iron tube until the compression is so great as to stop the piston, and with it the cage. As the resistance offered by the compressed air and hay or other material increases gradually and rapidly, so does the velocity of the descending cage gradually diminish until it is brought to rest.

The great objection at first made to the introduction of safety catches was the supposition that too great a dependence might be placed upon them, leading to a neglect of the proper precaution of a thorough daily inspection of the rope; and this objection for a long time in this country kept back the introduction of safety catches. Similar objections might, however, be made to the use of almost all safety appliances, but the more rational rule, "to take all possible practical precautions," has gradually led to the extensive use of such safety appliances, though the problem of a perfect safety catch cannot be considered as solved till the introduction of an arrangement which after the rupture of the rope shall bring the cage gradually and without shock to rest, whether the cage be ascending or descending; and whatever velocity it may have at the time of the breakage of the rope. Some practical approach appears to have been made to the fulfilment of this condition in the case of Hoppe's safety catch, and the more recent inventions have already produced some reliable safety catches.

#### FLAMELESS SUBSTITUTES FOR GUNPOWDER.

The new session of the Coal Mining Department of the Yorkshire College was inaugurated on Tuesday by a valuable and interesting lecture, in the Philosophical Hall, Leeds, on "Coal-getting by the Lime Process, and other Flameless Substitutes for Gunpowder," by Mr. Arnold Lupton, M.I.C.E., F.G.S., delivered to a large and influential audience. In the course of a few preliminary observations, the Chairman (Mr. Thomas Carrington, M.I.C.E., President of the Midland Institute of Mining Engineers) said that as he happened to have been an examiner of the Yorkshire district ever since the Act of 1872 came into operation, he could speak from his own personal knowledge of the considerable improvement that had taken place year after year in the efficiency of the candidates who had presented themselves for examination. They had been aware of one very prominent feature—that out of a great number of men who presented themselves as candidates for examination, a large number, though possessing very considerable practical experience and ability, had been rather deficient in theoretical and scientific knowledge; and that had by the examiners been felt to be a very serious drawback to their perfect fitness to occupy the positions they had sought to obtain; because, however clever and observant a man might have been in his own sphere of life as a colliery manager, there might suddenly arise occasions which would put the most perfect scientific knowledge to the test unless the manager had had sufficient training in scientific knowledge to connect cause and effect, and to provide for unforeseen contingencies. It was, therefore, two or three years ago unanimously agreed that two years' training in the Yorkshire College should be considered as equivalent to the same period employed in practical work in the colliery; the object being to give candidates every opportunity to get scientific knowledge as a supplement to their practical knowledge, and to make them as perfectly equipped as possible in the details of their profession. That, he ventured to think, had been attended with satisfactory results, because the candidates of the last two years had been found to be decidedly more efficient, more able, and possessing higher culture and training. The valuable metal had been more refined, and he hoped that the refining process would be continued by the Yorkshire College until the refined metal had been submitted through the Mint to the examiners and passed into currency. He did not mean to take the low view that practical and scientific knowledge should only be gauged by a money value, because he thought that knowledge, like virtue, should be its own reward. The mining engineer of the present day, if he were to keep in the fore front of scientific development, should be a mineralogist, a geologist, an accomplished chemist, also have a thorough knowledge of physics. He had great pleasure in presiding over that inaugural lecture, because he took a sincere interest in all that pertained to mining and mining engineering.

The danger of using gunpowder in mines had, Mr. Lupton remarked, long been recognised, and it was a rule never to use it in any mine or part of a mine unless it had been found by examination to be free from inflammable gas in such proportions that it could be detected with a safety lamp; and in mines liable to sudden eruptions the use of gunpowder was often prohibited altogether. Twenty years ago it was generally believed that no explosion could occur in a mine unless there was a proportion of gas, varying from 6 to 20 per cent. of the mixture of air and gas; this had now been found to be a mistake, for it had been found that a violent explosion could take place if only there were 2 or 3 per cent. of gas present, if in addition to the gas there was a great deal of dust in the air. All dry coal mines were dusty, and therefore liable to explode, even when reported quite clear of gas. Therefore, in fiery and dusty mines the use of gunpowder was always attended with risk. In many mines, consequently, the use of gunpowder had been either entirely prohibited or only used when most of the workmen were out of the pit. In such mines it was important to find a substitute for gunpowder. In order to estimate the importance of that question it was necessary to consider what the cost of getting coal in ordinary cases was. Coal could be got and put in railway trucks for a cost varying from 3s. 6d. to 5s. 6d. a ton, and of that only 9d. was for work requiring powder. What had now to be considered was how that item of 9d. was affected by the disease of gunpowder. At some collieries the abolition of explosives would cost 1s. 1d. per ton, and it was doubtful whether that amount would be exceeded in any colliery in the kingdom. It was very difficult to drive stone headings without explosives, but Col. Beaumont had a machine that would drive a heading in the hardest rocks met with in coal mines, except whinstone, at the rate of 1 ft. an hour, which was very much faster than the ordinary rate at which such work could be accomplished; the machine was driven by compressed air, and the use of explosives was unnecessary. The lecturer then explained a method of blasting with gunpowder and dynamite, in which a water cartridge was used, and the flame was entirely prevented. Mr. Macnab had given a great deal of attention to this invention. A compressed air cartridge had been used; it was a cast-iron shell, and was exploded by air at a pressure of 10,000 lbs. on the square inch. Also Grafton Jones's hydraulic wedge, Chubb's hydraulic ram, and Macdormott and Elliott's multiple expanding wedge. Having dealt

\* Being Notes on a Course of Lectures on Mining, delivered by Herr Berggrath Dr. von Gnaedrich, Director of the Royal Bergakademie, Clausthal, the Harz, North Germany.



with various processes for getting the coal without the aid of explosives, Mr. Lupton said that the last method to be introduced was the lime process. It had been known for ages that quicklime had the potentiality of heat and power. When mixed with water it developed considerable heat, and expanded in volume. It was not until recently that a practical method of using quicklime for coal getting was discovered. In this process lime was applied exactly in the same way as gunpowder, only in a much larger quantity, ten pounds of lime being used in a charge when one-third of a pound of gunpowder would suffice.

Having described how the holes were drilled, Mr. Lupton said they were charged with the purest kind of lime, in the form of a cartridge 4½ in. long by 2½ in. in diameter. The pressure used was 1½ tons to the square inch, and the cartridges as soon as made were packed in an air-tight box. Seven cartridges were gently rammed into each hole, which was then stemmed with clay. When the holes were charged a hand force pump was connected in turn by a flexible tube, with small tubes projecting from each hole, and fitting into grooves moulded on the sides of the cartridges. By this means a given quantity of water was pumped into each hole, equal in bulk to the lime. A tap at each end of the tube was then closed, and in one or two minutes the chemical action of the lime and water caused a great deal of heat, which converted the remaining water into steam. The pressure of this steam caused the coal to crack. In a short time, however, the steam either escaped or condensed, still the lime continued to work and expand, and on examining the cartridges after they had broken down the coal, it was seen that they enlarged the bore-holes. About half-an-hour after the charge had been watered the sprags might be withdrawn, and the coal would come down. This process had been successfully tested in hundreds or thousands of cases in South Wales, Lancashire, Durham, Derbyshire, Yorkshire, Belgium, and elsewhere, and been approved by many most competent mining engineers.

Compared with Grafton Jones's hydraulic wedge the lime process had the advantages of cheapness, safety, and economy of labour. When, however, the wedge machine was applied with good luck it could not doubt be worked as cheaply as the lime process, but it sometimes happened that the machine got fixed in a hole, and some trouble was then required to extract it. One advantage of lime over gunpowder was that several cartridges could be working at one time along a considerable length of face, each helping the other, whereas in gunpowder blasting only a single shot was fired. Only an approximate estimate could be given of the cost of working the lime process. Allowing five hours for boring 15 holes, two and a half hours would have to be given for charging and watering the same number, and in practice the work would have to be done by an experienced collier, paid (say) 5s. a day, assisted by a lad or a labourer paid 2s. 6d. a day. Supposing, then, that 15 cartridges broke 1200 cubic feet, or 40 tons of coal, the cost would be equal to 3½d. a ton. With gunpowder the same amount of work could be done for 2-1-10d. a ton, but on the other hand time was lost in consequence of men having to get out of the way while a shot was fired or while the smoke cleared away, and extra deputies had often to be engaged to fire the charges, so that, taking into consideration the greater proportion of large coal, the balance of profit might be found to be on the side of the lime process. It must, however, be borne in mind that the process was not applicable where great power was required, in narrow headings and in stone. The ideal mine of the future was one free not only from gas but from dust, and in which the use of gunpowder was superseded by lime or other flameless substitutes, and certainly the progress of engineering warranted the supposition that these conditions would ere long prevail.

In seconding Mr. Sagar-Mugrave's motion for a vote of thanks to the Chairman, Mr. W. G. Jackson spoke of the great value of the Coal Mining Department of the Yorkshire College to the rising generation; and the Chairman in acknowledging the vote said with regard to the use of lime in blasting that where there was a hard seam of coal the lime process was of very little use, because the time that had to elapse between the injection of the water and the time when the whole force of the steam had spent itself was so long that it became a very serious factor to the calculations when compared with the ordinary process of gunpowder. Where there was a tender seam of coal and a fiery mine, so that time was not the element to be considered, but where safety was of the first importance, then he could imagine that the lime process became one of much value. In hard seams of coal, where there was not much gas, and where time was of importance, it was a different thing altogether.

#### EXTENSION OF TECHNICAL EDUCATION.

Although great difference of opinion exists as to the average utility in the workshop or factory of men who have received a so-called technical training, as compared with those who have learnt their trade under the guidance and control of a competent practical, but, perhaps, otherwise imperfectly educated, workman, it cannot be doubted that at the present time technical education is popular with capitalists, and as boards of directors have now to a great extent replaced individual employers personally competent to conduct the trade they engaged in, it is almost essential that applicants for employment should have some kind of certificate to present, in order to facilitate the acceptance of their services. Formerly the manager of a concern was chosen by his principal, because that principal was able to judge of his own knowledge that he was competent for the post, and it was customary for the manager to select his subordinate officers and workmen upon the same principle; but at present the principal being represented by a body of gentlemen—half-pay officers, parsons, lawyers, and professional guinea-pigs—who do not pretend to any practical acquaintance with the business they have undertaken to manage as directors, they are not only reduced to the necessity of appointing a manager upon mere outside information, but are utterly incapable of determining whether the actions and suggestions of the manager so appointed are justifiable or otherwise. Indeed, upon this question each director will probably entertain a different opinion, the sole point upon which they are likely to agree being that the manager is "just as likely to be wrong as right," and that, therefore, they cannot do much harm by exercising managerial powers themselves.

It will readily be understood then that to capitalists and boards of directors the certificates of examining boards are absolutely invaluable since it enables them to find competent servants, although they themselves know nothing of the business engaged in. The marvellous results of this principle of selection, which may be considered exactly the reverse that which Darwin called natural selection has been fully evidenced in the case of the Indian gold mines in connection with which there have been the favourable reports of such men as Associates of the Royal School of Mines, professors, doctors, scientific engineers, mine clerks, and other professional seers, although common miners without the advantage of technical instruction have been utterly incompetent to discover even such indications of gold in remunerative quantities, in the districts thus favourably reported upon, as would have justified the expenditure of a single sixpence in following them. Whether the scientific or practical men were right can only be proved by the payment or otherwise of dividends upon the capital expended, and the shareholders in Anglo-Indian gold mines will not have much difficulty in calculating the percentage they have received upon their outlay, and determining therefrom whether they have received full satisfaction. Nor is the conflict of scientific and practical opinion confined to Indian mines; it is observable in the cases of American and other concerns, and in connection not only with mines but with commercial pursuits generally. Technical education is at all times valuable to practical men, but it must always follow practical experience in the mine or in the factory. When the technical education precedes practice it invariably produces a man which, even if he be honest, is neither useful nor ornamental in society.

The programme of the Technological Examination, 1882-83, of the City and Guilds of London Institute for the Advancement of Technical Education has just been issued, and shows the wide range of subjects undertaken. It appears that there are no less than 33 subjects of examination, the examiners in each of which being gentlemen whose names are publicly known in connection with the tech-

nology of the industries dealt with; and from the examination papers set last session, which are given by way of example, it is evident that the examiners are increasing their knowledge of what is likely to be required by the candidates—assuming them to come from the practical classes—and what is best calculated to promote the permanent success of the Institute. The questions are decidedly more practical than last year, and there are fewer of those the correct answering of which would indicate the candidates' acquaintance with the idiosyncrasies of the examiner rather than the possession of knowledge likely to be useful to him in his trade. As supplementary to good teaching in the mine or workshop that demanded for the certificate of the City and Guilds of London Institute for the Advancement of Technical Education can scarcely fail to prove useful to those receiving them, so that the Institute may fairly be congratulated upon the progress it is making.

#### PROVINCIAL STOCK AND SHARE MARKETS.

**CORNISH MINE SHARE MARKET.**—Mr. S. J. DAVEY, mine share dealer, Redruth (Oct. 12), writes:—Our market has been inactive most of the week, and prices of several mines declined, Carn Brea, Pedn-an-drea, South Frances, West Basset, Wheal Basset, and Wheal Uny being among this number, but much more business was done in South Crofty and West Seton. The former advanced to 14, and the latter to 25. To-day Dolcoath and East Pool are chiefly dealt in; the latter has risen to 85½ ex. div. of 30s. declared at Monday's meeting. Killfret and West Kitty steady. Subjoined are the closing prices:—Blue Hills, 1½ to 1½; Carn Brea, 8½ to 9½; Cook's Kitchen, 4½ to 4½; Dolcoath, 7½ to 7½; East Blue Hills, 10s. to 12s. 6d.; East Lovell, 1 to 1½; East Pool, 53½ to 54; Killfret, 5½ to 5½; Mellanear, 4½ to 5; New Cook's Kitchen, 6½ to 7; New Kitty, 2½ to 2½; North Busy, 3½ to 3½; Penhall, 1½ to 1½; Pedn-an-drea, 3 to 3½; Phoenix, 3 to 3½; South Crofty, 9½ to 9½; South Frances, 13½ to 13½; South Pool, 5½ to 5½; South Talcott, 13 to 13½; West Basset, 7½ to 7½; West Frances, 12½ to 13½; West Kitty, 14½ to 15; West Peavor, 10½ to 11; West Pollice, 4½ to 4½; West Polgreen, 5½ to 5½; West Tolgus, 17 to 19; West Seton, 24 to 24½; Wheal Agor, 16½ to 17½; Wheal Basset, 10 to 10½; Wheal Comford, 1½ to 2½; Wheal Grenville, 10 to 10½; Wheal Jane, 1 to 1½; Wheal Kitty, 2½ to 2½; Wheal Uny, 4½ to 4½; East Uny, 15s. to 17s. 6d.; Mount Carbis 2½ to 3.

—Mr. J. H. RETWELLS, stock and share broker, Redruth (Oct. 12), writes:—The market has, on the whole, been quiet during the week. At East Pool on Monday last a dividend of 12. 10s. per share was declared; shares were weak before and after the meeting until yesterday, when an enquiry sprung up and now close at 54½. Dolcoath steady at 7½; West Seton has improved from 19 to 25, closing rather sellers. Subjoined are the closing quotations:—Blue Hills, 1½ to 1½; Carn Brea, 9 to 9½; Cook's Kitchen, 4½ to 4½; Dolcoath, 7½ to 7½; East Blue Hills, 10s. to 12s. 6d.; East Lovell, 1 to 1½; East Pool, 53½ to 54; Killfret, 5½ to 5½; Mellanear, 4½ to 5; New Cook's Kitchen, 6½ to 7; New Kitty, 2½ to 2½; North Busy, 3½ to 3½; Penhall, 1½ to 1½; Pedn-an-drea, 3 to 3½; Phoenix, 3 to 3½; South Crofty, 9½ to 9½; South Frances, 13½ to 13½; South Pool, 5½ to 5½; South Talcott, 13 to 13½; West Basset, 7½ to 7½; West Frances, 12½ to 13½; West Kitty, 14½ to 15; West Peavor, 10½ to 11; West Pollice, 4½ to 4½; West Polgreen, 5½ to 5½; West Tolgus, 17 to 19; West Seton, 24 to 24½; Wheal Agor, 16½ to 17½; Wheal Basset, 10 to 10½; Wheal Comford, 1½ to 2½; Wheal Grenville, 10 to 10½; Wheal Jane, 1 to 1½; Wheal Kitty, 2½ to 2½; Wheal Uny, 4½ to 4½; East Uny, 15s. to 17s. 6d.; Mount Carbis 2½ to 3.

—Messrs. ABBOTT and WICKETT, stock and share brokers, Redruth (Oct. 12), writes:—The market has been quiet during the week. In the past week 30s. dividend declared at East Pool. To-day shares are in good demand, in consequence of improved prospects at the mine. West Seton are strong at an advance of 4 over last week's rates. Subjoined are the closing quotations:—Blue Hills, 1½ to 1½; Carn Brea, 9 to 9½; Cook's Kitchen, 4½ to 4½; Dolcoath, 7½ to 7½; East Blue Hills, 10s. to 12s. 6d.; East Lovell, 1 to 1½; East Pool, 53½ to 54; Killfret, 5½ to 5½; Mellanear, 4½ to 5; New Cook's Kitchen, 6½ to 7; New Kitty, 2½ to 2½; North Busy, 3½ to 3½; Penhall, 1½ to 1½; Pedn-an-drea, 3 to 3½; Phoenix, 3 to 3½; South Crofty, 9½ to 9½; South Frances, 13½ to 13½; South Pool, 5½ to 5½; South Talcott, 13 to 13½; West Basset, 7½ to 7½; West Frances, 12½ to 13½; West Kitty, 14½ to 15; West Peavor, 10½ to 11; West Pollice, 4½ to 4½; West Polgreen, 5½ to 5½; West Tolgus, 17 to 19; West Seton, 24 to 24½; Wheal Agor, 16½ to 17½; Wheal Basset, 10 to 10½; Wheal Comford, 1½ to 2½; Wheal Grenville, 10 to 10½; Wheal Jane, 1 to 1½; Wheal Kitty, 2½ to 2½; Wheal Uny, 4½ to 4½; East Uny, 15s. to 17s. 6d.; Mount Carbis 2½ to 3.

—Mr. M. W. BAWDEN, Liskeard (Oct. 12), writes:—The mining market for tin stock continues dull, and prices have not improved. There is an enquiry for shares in most copper mines on the advance of the standard for copper ore. Devon Consols, East Caradon, Marke Valley, West Caradon, and Wheal Crebor chiefly in demand. Subjoined are the closing quotations:—Bedford United, 2½ to 2½; Carn Brea, 9 to 9½; Cook's Kitchen, 4½ to 4½; Dolcoath, 7½ to 7½; East Blue Hills, 10s. to 12s. 6d.; East Lovell, 1 to 1½; East Pool, 53½ to 54; Killfret, 5½ to 5½; Mellanear, 4½ to 5; New Cook's Kitchen, 6½ to 7; New Kitty, 2½ to 2½; North Busy, 3½ to 3½; Penhall, 1½ to 1½; Pedn-an-drea, 3 to 3½; Phoenix, 3 to 3½; South Crofty, 9½ to 9½; South Frances, 13½ to 13½; South Pool, 5½ to 5½; South Talcott, 13 to 13½; West Basset, 7½ to 7½; West Frances, 12½ to 13½; West Kitty, 14½ to 15; West Peavor, 10½ to 11; West Pollice, 4½ to 4½; West Polgreen, 5½ to 5½; West Tolgus, 17 to 19; West Seton, 24 to 24½; Wheal Agor, 16½ to 17½; Wheal Basset, 10 to 10½; Wheal Comford, 1½ to 2½; Wheal Grenville, 10 to 10½; Wheal Jane, 1 to 1½; Wheal Kitty, 2½ to 2½; Wheal Uny, 4½ to 4½; East Uny, 15s. to 17s. 6d.; Mount Carbis 2½ to 3.

—Mr. JOHN CARTER, mine share dealer, Camborne (Oct. 12), writes:—In the share market this week several mines have declined heavily—Carn Brea, Tincroft, West Basset, Penhall, Wheal Kittys, West Kitty, and Wheal Uny. East Pool fell to 8½, but have again improved to 53½. West Seton have fluctuated between 20 and 25, closing at 25. Closing quotations are annexed:—Carn Brea, 9 to 9½; Cook's Kitchen, 4½ to 4½; Dolcoath, 7½ to 7½; East Blue Hills, 10s. to 12s. 6d.; East Lovell, 1 to 1½; East Pool, 53½ to 54; Killfret, 5½ to 5½; Mellanear, 4½ to 5; New Cook's Kitchen, 6½ to 7; New Kitty, 2½ to 2½; North Busy, 3½ to 3½; Penhall, 1½ to 1½; Pedn-an-drea, 3 to 3½; Phoenix, 3 to 3½; South Crofty, 9½ to 9½; South Frances, 13½ to 13½; South Pool, 5½ to 5½; South Talcott, 13 to 13½; West Basset, 7½ to 7½; West Frances, 12½ to 13½; West Kitty, 14½ to 15; West Peavor, 10½ to 11; West Pollice, 4½ to 4½; West Polgreen, 5½ to 5½; West Tolgus, 17 to 19; West Seton, 24 to 24½; Wheal Agor, 16½ to 17½; Wheal Basset, 10 to 10½; Wheal Comford, 1½ to 2½; Wheal Grenville, 10 to 10½; Wheal Jane, 1 to 1½; Wheal Kitty, 2½ to 2½; Wheal Uny, 4½ to 4½; East Uny, 15s. to 17s. 6d.; Mount Carbis 2½ to 3.

**MANCHESTER.**—Messrs. JOSEPH B. and W.P. BAINES, share brokers, Queen's Chambers, Market-street (Oct. 12), write:—Although the amount of business concluded, except in a few prominent stocks, is small, a distinctly better tone has been apparent in the market during the past week, owing doubtless to the plentiful supply of money, and a better prospect of an amicable conclusion of what threatened to be a dangerous wages dispute in the coal trade. A few stocks have shown considerable animation, and in these the bulk of the transactions have taken place, the occurrence of the fortnightly settlement having tended to restrict business in others. Egyptian stocks have ruled strong, with steady upward tendency till 10, when a little decline was seen. In the several classes of miscellaneous shares there is little to note excepting a stronger feeling in iron, coal, &c. shares, traceable to a large extent to the hope of the wages question being settled peacefully.

BANK shares have been very quiet, very few dealings being marked and quotations having undergone no alteration saving a decline in Union of Manchester, which is ¼ to ½ lower.

INSURANCE investments still sluggish, but quotations do not show such an all-round depreciation as we have had to report for some time back. Thames and Mersey Marine showed a decline of ½ at one time; but though they have since recovered, and now buyers' offers are same as last week, and sellers' figure is put up ¼. Lancashire Insurance, sellers quote ½ down. Other changes are as follow:—Higher: Manchester Underwriters, ¼; National Boiler, ¼; and Maritime, ¼. Lower: Commercial Union, ¼; British and Foreign Marine, ¼; Liverpool and London and Globe, ¼; Reliance Marine, ¼; and Queen, ¼. COAL, IRON, &c., and MINING: For the first time for several weeks past we have to notice an approach to general improvement herein, the alterations in value showing a good majority of advances. Bolckow, fully paid, made a small advance, and the new ordinary (now 16d. paid) are also better; but sellers' figures for the 12d. paid is a fraction lower. Ebbw Vale quiet, but turn better. Canadian Copper, &c., show little doing, and are a little down; but to-day's prices show a fair recovery from lowest prices of week. Tharais Sulphur, &c., are lower, and without dealings here. Indian Glenrock Gold, after marking ½ down, have rallied ¼, a rise of ¼ from figures quoted last Thursday. Great Laxey Lead Mine, now quoted ex the usual quarter's dividend of 6s., are unchanged. Higher: Telegraph Consolidated and Maintenance, 1; Earle's Shipbuilding, ¼; Lynvi and Kendu Ordinary, ¼; Bolckow (fully paid), ¼; Patent Nut and Bolt, ¼; John Brown's, ¼; Ebbw Vale, ¼; Indian Glenrock, ¼; and Tredgare Coal, &c., ¼. Lower: Palmer's Shipbuilding (B), ¼; Tharais, ¼; Rheebridge Coal, &c., ¼. ¼ to ½; and Canadian Copper, &c., 9d.

COTTON SPINNING, &c.—This market is somewhat irregular. With a few fluctuations prices ruled strong up to yesterday, when it became quiet, and though figures do not recede much the demand is sluggish and few dealings are recorded.

TELEGRAPHS.—Only a few transactions marked herein, and figures have remained almost stationary till to-day, when several issues showed advance, notably Anglo, each description of which mark substantial rise, the Ordinary being 1½, Deferred ½, and Preferred 2. Direct United States Cables also quote ¼ better, but West Indies and Panama are ¼ down, and West Indian and Brazilian show a decline in buyers' offers of ¼. TELEPHONE (day). Lancashire and Cheshire 3d. lower, but United exhibit a rise (marked to-day) of ¼. CANALS are unaltered, except a rise of ¼ in Bridgewater Navigation Ordinary. CORPORATION STOCKS, &c.—More stock offering. Generally figures show alteration, but Manchester stock is offered ¼ lower. MISCELLANEOUS SHARES.—A fair business was done in these on Friday last. Since then, however, only little has been reported. Gosses and Winkworth have further advanced ¼. Hudson's Bay shares mark a solitary transaction, and after being put up ½ have fallen back to prices same as last week. Manchester Carriage and Tramways generally firm, but the B issue are offered at ¼ decline. West-heads steady; Rylands and Sons little weaker; Bradbury and Co. gradually strengthening.

RAILWAYS.—Several influences have tended to help values in rails during the week, but Manchester stock is offered ¼ lower. The cheaper rates for loans, and the easier contingencies prevalent at the end of the settlement. All

these combined to give an impetus to the leading lines, and a considerable improvement is the result. The Bank return was, however, to-day below expectations, and for a moment this unhinged the "bulls," and some free selling occurred, but at the close the evening's prices were again very good. Wigan's A's once more an exception, changed this account from heavy backs to a slight contango, and value was sent momentarily down to 12½, from which a smart reaction is recorded. Scotch lines good, as also are North Staffords. The Canadian market has been a scene of wild excitement at times, and prices record a sensible advance; the Grand Trunk traffic to-day was, however, somewhat below anticipations, and easier figures have been general. Americans continue sensitive, owing to money market in New York being so changeable. On the whole, although highest prices are not maintained, there is a distinct general rise on the week, though a relapse is quoted to-day on lower quotations from the other side.

**EDINBURGH.**—Messrs. THOMAS MILLER and SONS, stock and share brokers, Princes-street (Oct. 11), write:—There has been an increased disposition to purchase home railway stocks, and markets have improved. During the week Caledonian has advanced from 107½ to 109½; North British from 93½ to 95; Great North of Scotland from 58½ to 59½. Great Western and North-Eastern have been in special favour, and have risen from 142½ to 146½, and from 170 to 173½ respectively. Brighton Deferred have been exceptionally weak, and has receded from 123½ to 122½. The upward movement in Canadians has continued. Grand Trunk Ordinary has risen from 25½ to 27½, and the Third Preference from 58½ to 63½. Great Western of Canada shares from 15½ to 16½. In American the various issues of the New York, Pennsylvania, and Ohio Companies have been in favour. The First Mortgage Bonds have improved from 54½ to 55½; the Second from 21½ to 24½; the Third from 11 to 11½. Erie has risen from 43½ to 44½; Ontario from 28½ to 29; Oregon Preference from 58½ to 58. The business done in bank stocks has all been at previous prices. A rise from 31 to 32 in North British and Mercantile is almost the only change in insurance shares. Arizona Copper shares have maintained previous prices—79s. Clyde Coal have receded from 60s. 6d. to 57s. 6d. Burntisland Oil have risen from 11½ to 11¾; Dalmeny Oil from 22 to 24. Young's Paraffin have receded from 12½ to 11¾. Asses' Company have declined from 7½ to 6½.

#### SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

**STIRLING.**—Mr. J. GRANT MACLEAN, sharebroker and ironbroker, (Oct. 12), writes:—During the past week the market has been firmer, owing to the favourable reports of trade and the easier tendency of the money market. The Board of Trade Returns for the month of September are comparatively satisfactory, and it is expected business generally will be much brisker this winter.

In shares of coal, iron, and steel companies prices are firm. In the Scotch iron market the price of warrants declined from 51s. 10½d. to 50s. 8d., but now seems inclined to improve, owing to the rapid decrease in stocks, and the rise in the price of coal, as well as the demand of miners for more wages. Curd and Swansea Coal are at 30s. to 40s. Chapel House Colliery, 10s. to 20s.; Llynvi and Tondy, 7 to 7½; ditto (pref.), 7s. 6d. to 7s. 6d.; New Sharncliffe (pref.), 9s. 6d. to 10s.; Rhymney iron (debtentures), 102 to 104; and Stourbridge (pref.), 20s. to 25s.

In shares of foreign copper and lead companies prices do not show much alteration, but Mason and Barry have advanced 3s. 3d. on the interim dividend declared at 10s. per share, payable Oct. 23. Taurus Silver-Lead Ordinary and Pref. offered. Tharais declined from 44½ to 43½, but are now firmer at 44½; the case against this company in the Court of Session has been withdrawn, so the reconstruction of the capital will now be proceeded with on share warrants to bearer issued, if desired. At last balance 32,727s. was set apart in the event of this case being decided against the company, so this sum will now go to help the current year's dividends. A saving of about 12,500s. per annum will also be gradually effected by the debentures being paid off. Corporation of South Australia are at 10s. to 15s.; Huntington, 22s. to 25s.; Hungarian, 5s. to 10s.; Hulsafal, 7s. 6d. to 10s.; Norway Copper, 2s. 6d. to 7s. 6d.; Soudabek and Catir Alan, 15s. to 20s.; Santa Cruz, 2s. 6d. to 3s. 9d.; Viscaya Santander, 10 to 10½; and York Peninsula (Preference), 20s. to 25s.

In shares of home mines, business has continued active. Glasgow Caradon remain at 17s. to 18s., and this company's next sale of ore, on the 10th inst., will be 170 tons, as against 160 tons in August; there was no sale in October last year, but in September 140 tons were sold. The sales in the month of October in previous years ranged from 140 up to 300 tons. Minerva, offered; Bwch United are at 10s. to 15s.; Blue Hills, 25s. to 30s.; Carnarvonshire Great Consols, 15s. to 25s.; Devon Consols, 7 to 7½; East Devon Consols, 30s. to 35s.; East Chilverton, 17s. 6d. to 22s. 6d.; East Wheal Rose, 17s. 6d. to 22s. 6d.; Frognoch, 25s. to 30s.; Grogwinion, 15s. to 25s.; Gover Consols, 5s. to 10s.; Gorsegod and Merilyn, 30s. to 40s.; Great Polgoh United, 4s. to 6s.; Indian Queens, 5s. to 10s.; Kit Hills, 7s. 6d. to 12s. 6d.; Langfords, 7s. to 9s.; Mount Carbis, 40s. to 50s.; New West Caradon, 6s. 6d. to 8s. 9d.; North Levant, 4 to 5; Old Shepherds, 11s. to 13s.; Old Owlcombe, 1s. to 3s.; Penhall, 30s. to 35s.; Prince of Wales, 10s. to 12s. 6d.; Pennant, 35s. to 40s.; Parkas, 5s. to 10s.; Silver Hills, 7s. 6d. to 12s. 6d.; South Crebor, 5s. to 7s. 6d.; Sinclair, 20s. to 30s.; South Crofty, 14 to 16; St. Just United, 10; Tankerville, 5s. to 7s.; Treavean, 15s. to 17s. 6d.; Tin Hills, 10s. to 15s.; Walkham United, 2s. 6d. to 5s.; West Crebor, 7s. 6d. to 10s.; West Holway, 10s. to 15s.; West Lisburne, 12s. 6d. to 17s. 6d.; West Caradon, 10s. to 15s.; West Seton, 25s. to 30s.; West Frances, 12½; West Devon Great Consols, 10s. to 15s.; Wheel George, 10s. to 20s.; Wheal Crebor, 62s. 6d. to 67s. 6d.; Wheal Kitty, 50s. to 55s.

In shares of gold and silver mines Richmond have improved to 9½; California Gold wanted. Alankoo are 6s. 3d. to 8d.; Colombian Hydraulic 4s. to 6s.; Cedar Creek, 1s. 3d. to 3s. 9d.; Exchequer, 2s. 6d. to 3s. 9d.; Gold of Canada, 10s. to 15s.; Gold Coast, 17s. 6d. to 22s. 6d.; Indian Consolidated, 12s. 6d. to 15s.; Indian Kingdom, 3s. to 5s.; Kapanga, 17s. 6d. to 20s.; Kohinoor, 25s. to 27s. 6d.; La Plata, 40s. to 42s. 6d.; Nundydoo, 5s. to 7s. 6d.; New Calico, 7s. 6d. to 12s. 6d.; New Gold Run, 3s. 9d. to 5s.; ditto, Preference, 4s. 6d.; Organos, 37s. 6d. to 42s. 6d.; Rossa Grande, 2s. 6d. to 5s.; and Simon's Reef, 1s. 6d.

In shares of oil and miscellaneous companies there has been less business doing, and oil shares are now inclined to droop. Midlothian have declined from 7½ to 7, and Uphalls from 9½ to 8½. Lawes Chemical, 6½ to 6¾; Langdales, 7s. 10 to 7s. 10; and Newcastle, 25s. to 30s.

#### IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

**CORK.**—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mall (Oct. 11) write:—Markets were quiet but steady to-day. Great Southern, changed hands at 116½ to 117, and Midlands at 88; Limericks were also done at 27, and Bandons were asked for at 88. National Banks were done at 23 15-16ths, and Munsters at 6 15-16ths to 7; Hibernians were also bought at 33 ½ Cork Steam Packets remain 11, and Lyons shares 5 5-16ths. Gresham Hotels changed hands at 3½, with dividend, and Gouldings at 8½. Brewery shares were offered at 5½, and Harbour Board debentures at 102 to 102½.

**RIO MALAGON (SULPHUR, COPPER, AND SILVER) MINES.**—Mr H. Woodburn Kirby, the liquidator, announces the declaration of a dividend of 27. 10s. per share on the 5½. paid shares of the company.

**HOLLOWAY'S OINTMENT AND PILLS.**—Diseases of the skin, ringworm, scurvy, scorbatic eruptions and swellings, sore heads, and the most inveterate skin disease to which the human frame is subject, can not be treated with a more easy and reliable remedy than Holloway's ointment and pills, which act so peculiarly on the constitution, and so purify the blood that those diseases are at once eradicated from the system, and a lasting cure obtained. They are equally efficacious in the cure of eruptions, burns, scalds, glandular swellings, ulcers, wounds, rheumatism, and contracted and stiffened joints. These medicines operate mildly but surely. The cures effected by them are not temporary or apparent only, but complete and permanent.

#### COPPER ORES.

Sampled Sept. 20, and sold at Tabb's Hotel, Redruth, Oct. 5.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Mellanear.....	78	£4 10 6	Levant.....	70	£10 0 0
ditto.....	75	4 6 0	ditto.....	69	7 10 0
ditto.....	74	4 8 0	ditto.....	65	7 15 0
ditto.....	72	4 4 0	West Tolgus.....	61	7 0 0
ditto.....	70	4 0 0	ditto.....	55	7 10 0
ditto.....	68	4 1 0	Botallick.....	30	7 9 0

#### TOTAL PRODUCE.

Mellanear.....	506	£2087 7 0	West Tolgus.....	183	£1757 11 0
Levant.....	201	1700 8 0	Botallick.....	30	223 10 0

Average standard..... £107 9 0 | Average produce..... 8½  
Average price per ton..... £8 5 6  
Quantity of ore..... 920 | Quantity of fine copper, 77 tons 4 cwt.

Amount of money..... £5766 5 0  
LAST SALE.—Average standard, £110 10 0 | Average produce..... 8½  
Standard of corresponding sale last month, £109 0 0 | Produce, 8½

#### COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Vivian and Sons.....	707	£3785 15 0
Keவில், Druce, and Co.....	30	223 10 0
Williams, Foster, and Co.....	128	1328 0 0
Mason and Elkington.....	55	429 0 0
Total.....	920	£5766 5 0

NO SALE on Thursday next, Oct. 12.

Copper ores for sale on Thursday next, at the Royal Hotel, Truro.—Mines and parcels.—Devon Great Consols 1015—Wheal Crebor 467—South Caradon 420—South Devon United 310—Gawton Copper 228—Marke Valley 200—Glasgow Caradon 170—Bedford United 112—Holmboe 100—Phenix 36—Huntingdon Dowa 34—Mid-Devon 28.—Total, 3120 tons.

The above sale will commence at Twelve o'clock.



## MINERAL RESOURCES OF NEW SOUTH WALES.

We have been favoured by the Under-Secretary for Mines—Mr. HARRIS WOOD—with his annual report, that for 1881, to the Minister of his department just issued. It appears that the colony has already yielded more than 55,000,000 lbs. worth of useful minerals, and that the production for the year now reported upon was 149,627 ozs. of gold, of the value of 566,518*l.*; and of silver, 87,254*l.* ozs., worth 13,026*l.*; coal, 1,775,224*l.* tons, worth 603,248*l.*; shale, 27,894 tons, worth 40,748*l.*; tin ingots, 7590*l.* tons, tin ore and regulus, 609*l.* tons, worth together 724,003*l.*; copper ingots, 5361 tons, copper ore and regulus, 182*l.* tons, worth together 355,062*l.*; iron, 6560 tons, worth 47,874*l.*; antimony ore, 302*l.* tons, antimony metal, 236*l.* tons, worth together 17,346*l.*; lead, 52*l.* tons, worth 1625*l.*, or over 30*l.* per ton; bismuth, 12*l.* tons, worth 2729*l.*; and mixed minerals 15*l.* tons, worth 1020*l.*. The aggregate value of the minerals in 1881 exceeds that of any year since 1875, and exceeds the decennial average by 44,816*l.*. The number of applications to lease parcels of land for the purpose of mining for gold and other minerals made during the year 1881 was 1329, which, as compared with the number for 1880, shows an increase of 344. Of the 1829 applications so made 786 were for auriferous lands and 543 were for mineral lands. The number of applications dealt with during the year 1881 was 891, which, as compared with the number dealt with in 1880, shows a decrease of 13. Nevertheless, the number disposed of in 1881 largely exceeds the number in the year 1879 and preceding years. Considering the increase in the number of applications made during 1881, the falling off in the number dealt with in that year is much to be regretted, and it is feared mainly attributable to the system of survey, the defects of which become more apparent under an extra influx of work. Of the 891 applications dealt with during 1881, 400 were for gold-mining leases, comprising in the aggregate an area of 2088 acres, and 482 were for mineral leases, containing in the aggregate 16,073 acres.

During the year the conditions under which permissions will be granted to mine upon or under reserved lands were settled, and the obstacle to dealing with such applications had thus been removed; it may, therefore, reasonably be expected that during the year 1882 a large number of these applications will be disposed of. As compared with 1880 there is an increase in the acreage applied for under lease gold, bismuth, shale, copper, and slate; a decrease in the acreage for antimony, coal, silver and copper, and tin; and the areas applied for for chromate of iron, cobalt, galena, manganese, &c., may be regarded as indicating a desire to open new branches of mining. The decrease in the area for coal is mainly due to the large area of coal land purchased; the decrease in the area for silver is probably due to the difficulty experienced in treating the ores in the colony and the great expense of sending them to a port for shipment to England; and the decrease in the area for tin is, I think, mainly due to the long and severe drought, which has not only retarded operations generally on our tin fields, but has prevented the opening up of new ground. Upon the tin fields mineral licences are now much availed of, not only for the purpose of searching for new deposits of tin ore, but also for working small areas in places where the operative miner can win the ore without the aid of expensive appliances. The large increase in the acreage under gold lease application is not, I think, so much due to newly-discovered fields (because from the Albert, Temora, and some others there are very few, if any, applications to lease) as to the fact that the attention of capitalists is at length being drawn to the fact that our older gold fields, which no longer possess any or comparatively slight attractions for the digger, are well worthy the attention of those who can bring capital and skill to bear upon them.

With scarcely an exception the reports on gold furnished by the warden and mining registrars state that work on the gold fields has been retarded or altogether stopped for want of water during a great part of the year. The want of water has, of course, been most felt on the Albert gold field, where nearly all the gold has been obtained by a rough process of dry-blowing, but on most of the older fields there has been a great scarcity of water during part of the year, in some cases not sufficient for domestic purposes. In view of the absence of water for mining purposes on the Albert gold field, the output of gold is really wonderful, and is suggestive of the results which might be obtained were a plentiful supply of water obtainable. Though gold was discovered at Mount Poole in October, 1880, very little was won that year. In February, 1881, gold was found at Mount Browne, and in April at Good Friday, Easter Monday, &c. About the same time the Pioneer Reef at Wamberiga Range was discovered, and then followed three other reefs, varying in width from a few inches to several feet, and in some instances showing gold freely. Within three months of the discovery of Mount Browne a tract of country 80 miles by 10 miles had been opened, and during the last six months of the past year it is estimated that a population of about 2000 was scattered over this tract. The workings so far consist almost entirely of surface deposits, but one party is said to have obtained 6 dwts. per load from a depth of 180 feet; and another party obtained payable prospects at 70 ft. in Devonian conglomerate. The gold is coarse and water-worn. The deepest sinking in the granite formation up to the end of the year was 10 ft. It appears to be more than probable that payable deep leads will be found in the Albert gold field, and that the discoveries of auriferous deposits will extend over a very much larger area than at present. The opinion of those best qualified to judge from personal inspection is that the field will prove a permanent and important one. If so, the effect of the discovery will be most important, as it will settle a large population in the most remote portion of the colony, which, until quite recently, was not only almost unknown and quite unsettled, but was considered unfit for settlement.

From the present prospects of the Temora gold field it appears very questionable whether the yield of gold from the alluvial deposits will in future equal that of the past year, even though the supply of water should improve; still it is almost certain that the high price charged for pitting in consequence of the limited water supply has prevented the working of deposits which, with an ample supply of water would pay handsomely. Very rich veins were struck at Upper Temora towards the end of the year. The Nana Creek gold field, which was discovered in May, 1881, is likely to prove an extensive and important quartz mining locality, in some respects similar to Copeland. The warden at Copeland shows that from 17 mines on that field 8553 tons of stone have yielded 22,667 ozs. of gold, or an average of 2 ozs. 13 dwts. per ton; that the reefs vary in width from 8 in. to 3 ft., and that the depth from which the stone was taken varies from 60 to 370 ft. The highest average from the reef 12 in. wide is 4 ozs. 15 dwts. 1 gr., and the lowest from a reef 16 in. wide is 16 dwts. 20 grs. The Mount McDonald gold field, which was discovered on June 10, 1880, was more happily situated than Nana Creek in the matter of crushing mills, being in the vicinity of older gold fields where such mills had been in use; consequently, four batteries have been erected, and doubtless a very large quantity of stone would have been crushed but for the drought, which caused the mills to stop through want of water. As it is, 1713 tons were crushed, yielding 2701 ozs., or an average of 1 oz. 11 dwts. 13-43 grs. per ton. The report from the Bathurst district states that payable gold has been found under the basalt in some hills near Rockley, but the deposit has not yet been sufficiently tested to enable any opinion to be formed of the value of the discovery. It is to be hoped that the deposit will be thoroughly tested, as there is a large extent of similar country not only in the Bathurst district, but in several other districts. In the Tuena division a number of new reefs have been discovered, some of which promise well. From one of the reefs a patch of 80 ozs. of gold was obtained from 80 lbs. of stone. The newly-discovered reef at Kydra, near Nimitybelle, are in the opinion of the warden likely to turn out payable if water can be obtained in sufficient quantity, and machinery be brought on to the ground. The newly-discovered reefs on the Gundong ranges, in the Dubbo district, between Obley and the Bogan, have been tested; 2 tons of quartz sent to the Mint gave 2 ozs. 18 dwts. 12 grs. Small quantities of alluvial gold have also been obtained. The reefs and alluvial deposits discovered at Paddy's river, near Marulan and Manandfield, have not so far proved of any value.

The mining registrar of the Gunning division states that although

gold can be found in small quantities in nearly every little creek, no one has been found with sufficient enterprise to seek for it further than a few feet below the surface. In the Queanbeyan division, a quartz reef, Holtermann's, 30 ft. wide, is said to have been discovered at Captain's Flat, Molonglo river. The quartz is very soft, and is said to yield 7 dwts. per ton. There is no crushing machinery near, but a plant is about to be placed on the ground. At Upper Adelong a new reef was discovered, from which a trial crushing of 9 tons gave 46 ozs., and a further crushing of 18 tons, taken from a depth of 70 ft., gave 27 ozs. There is no battery on the ground, and stone has to be carted to Adelong at a cost of 25*l.* per ton. The various extracts given indicate the possibility of very considerable improvements on our gold fields if the necessary appliances and an abundant supply of water be available. The number of gold miners employed in 1881, according to the returns of the mining registrars, was 9056; of these 1343 were Chinese. This number is much smaller than that returned for 1880, which, by the way, was probably an over-estimate. Of the 9056 miners, 1947 were engaged during 1881 in quartz mining, and 7109 were employed in alluvial mining. Taking the output of gold in 1881 to be, as represented by the mining registrars, 153,006 ozs., valued at 565,308*l.*, the earnings of each miner, if all the gold were distributed equally amongst them, would be 16 ozs. 17 dwts. 21-85 grs., equal to 62*l.* 8*l.* 6*l.*, for the year's work.

The great decrease in the output of silver for 1881, as compared with the previous year, is mainly due to the fact that all the chloride ores in view in the principal Boorook Mines had been exhausted, and the appliances on the field were not suitable for the treatment of the sulphides. Moreover, the owners of some of the principal mines were not in a position to incur the expense of erecting the works necessary for the proper treatment of the last-mentioned ores. During the year some arrangement was made in regard to the ownership of the mines under which Mr. Benjamin Davey, an experienced metallurgist and mining engineer, and some other gentlemen, had commenced the erection of the necessary furnaces, but they were not completed at the end of the year. A large quantity of ore is at grass ready for treatment. It is to be hoped that under the management of Mr. Davey, the valuable lodes at Boorook will be thoroughly tested, and the mines and smelting works put into such order as will enable a large quantity of ore to be raised and effectively treated. At the present time the treatment of silver ores is quite a new industry in this colony, and until proper methods become better understood and more generally known the prospect of developing the lodes which exist in various parts of the colony is not likely to be successfully undertaken. The warden reports that the silver mine at Moruya, which had been idle for some time, was started again during the year.

The improved price of tin has had a most beneficial effect upon this branch of mining. One of the effects produced has been the reworking, with profitable results of ground which had been abandoned as worked out; another the impetus given to prospecting. Unfortunately, however, the severe drought has in many places prevented the carrying on of prospecting operations. But for the drought, the high price of tin would have led to an enormous increase in the output of tin ore, as all the mines would have been kept in full work. The effects of the drought appear to have been more severely felt in the Vegetable Creek and Maryland fields than in the Inverell division. In the Vegetable Creek and Glen Innes divisions the year 1881 is said to have been the driest within the memory of the oldest inhabitant; and in the Maryland division also the scarcity of water has been so great that large quantities of wash dirt had to be stacked because there was no water to wash with. Notwithstanding the drought the quantity of tin exported exceeds that of any year since the tin fields were opened. The Great Britain Tin Mining Company were engaged during the year in developing the tin lodes on their property at the Mole Tableland. On the common lode they have sunk to a depth of 104 feet, at which point the lode is 4 feet wide, but only 18 in. bears tin in quantity. Several promising tin lodes were discovered during the year at Mole Tableland. One rich lode has been proved to a depth of 25 ft. where it is 2½ ft. wide. Several of the mines at Vegetable Creek contain valuable deposits of tin ore. In one part of the Wesley Mine, the deepest on the field, the wash is 7 ft. high, and 90 ft. wide; this deposit is 200 ft. below the surface. At the local (Glen Smelting Company's) smelting-works 2039 tons of ore were purchased during the year, and the output of refined tin was 1502 tons. In the Tingha division the mining registrar reports that a number of new discoveries were made during the year both in shallow and in deep ground in various parts of the division. And the warden states that there is an abundance of virgin ground in the district. Should the present price of tin be maintained, and an adequate supply of water be available on the several tin fields during the current year, the output of tin should largely exceed that of last year. After reading this report the absurdity of British tin miners pretending that there are no lodes in Australia is obvious.

Though the quantity of copper exported in 1881 exceeds that of any previous year, the aggregate value of the output is less than that of 1880. This shows that even a reduction upon the previously low price of copper has not had the effect of damping the energy and enterprise of the companies engaged in this branch of mining, and that our mines are capable of competing successfully with those of other countries. At the Great Cobar Copper Mine, although the severe drought has greatly retarded operations, the output of ore for the year amounted to 21,109 tons. The quantity of ore smelted was 21,532 tons, producing 2568 tons of fine copper. The principal lode in this mine is 40 ft. in width. At the Nymagee Copper Mine the quantity of ore raised since the starting of the company in 1880, is 6571 tons. The quantity of ore smelted was 6053 tons, yielding 859 tons of fine copper. The principal lode in this mine is 15 ft. to 25 ft. wide. During the year the Girilambone Copper Mine, on the Great Western Railway line, 25 miles from the Nyngan railway station, was opened, and a large amount of work was done during the year. The lode, so far as tested, appears to be 6 ft. to 25 ft. wide. At Burrows the Frogmoor Copper Mine has started again under a company. Besides the furnaces already on the mine, works are being erected for the treatment of poor ores by the wet process. There are said to be thousands of tons of poor ore at grass which would not pay to refine under the old system, which can be profitably treated by the wet process. Valuable copper lodes are said to exist in the Cooma division, which cannot at present be profitably worked owing to the expense and difficulty of sending the ore to Sydney, but which will be opened up as soon as the railway has been extended to Cooma.

The quantity of lead exported during 1881 exceeds that of previous years, but there is no immediate prospect of its becoming an important item in the mineral products. Large quantities of antimony ore are being raised at Gara Falls and at Hargrave Falls, near Armidale. At Hargrave Falls the best ore is obtained at the bottom of the falls, and most of this is carried up by means of packhorses, each horse carrying about 1 cwt. at a time. At Gara Falls most of the ore is obtained from the surface. At the local smelting-works 270 tons were smelted during the year. During the year 1881 12 tons 10 dwts. of bismuth, valued at 2728*l.* 14*l.*, was obtained from the Kingsgate Company's Mine, near Glen Innes. There is at present no machinery on the mine, but the ore is extracted by means of sluicing where the matrix is sufficiently friable. Although lodes have been found in other localities they do not appear to have been worked yet. During 1881 several leases were applied for with the object of working a manganese lode at Caloola. Although lodes have been found in various localities, there is no report of any of them having been worked up to the present time. A slate quarry was opened during 1881 at Millamurah, in the Bathurst district, and 18,000 slates were taken out. A company has been formed to work this quarry, and it is stated that extensive machinery is being obtained from England with a view to carry on the work in a systematic manner, and on a large scale. During the year slate was found in the Bathurst district, at Caloola, and at Newbridge.

Though the output of coal for 1881 largely exceeds that of any previous year, the value thereof is less by 12,088*l.* 5*l.* 11*l.*, than that of 1880. The average price per ton of coal was lower in 1881 than in any previous year since 1834. This reduction in price has probably

caused or contributed to the increased output, which exceeds the increase of any year, with the exception of 1856, since our coal mines were opened. The increase in the quantity of coal consumed in this colony is not very marked, but the quantity exported in 1881 largely exceeds that of 1880, and the proportion of the excess sent to foreign ports exceeds that sent to intercolonial ports. The output of the collieries in the northern district in 1881 exceeds that of 1880 by 273,463 tons, while the value of the coal raised in 1881 is less than that of 1880 by 22,103*l.* 6*l.* 8*l.*. The output in the western district for 1881 shows an increase over 1880 in quantity of 16,832 tons, and in value of 5379*l.* 11*l.* 9*l.*. The output of the southern collieries for 1881, as compared with that of 1880, shows an increase in quantity of 18,699 tons, and in value of 4635*l.* 9*l.*. Coal has been discovered at Billimore, on the Talbragar, six miles beyond Barabial, N.E. of Dubbo, and an attempt is being made to discover a workable seam of coal in that locality. If successful this will be of great advantage in supplying the engines on the extension of the Great Western Railway, and will probably lead to the establishment of new industries at Dubbo, which will materially enhance the prosperity of that town. At Jervis Bay a bore was put down to a depth of 900 ft. by means of the diamond drill, with a view to discover a workable seam of coal, but so far as is known without success. The number of mines from which kerosene shale is being raised continues the same—two. From these the output during 1881 exceeds that of 1880 by 5693 tons, but the average price in 1881 is considerably less than during any previous year. The reduction in the price of kerosene shale is probably due in some measure to the reduction in the price of coal. To what extent the reduced price has contributed to the increase in the output is not easily determined, but may reasonably be assumed that it has to some extent affected it.

## A NEW METHOD OF SEPARATING MINERALS.\*

The separation of intimately intermixed minerals from each other has hitherto been effected mainly by taking advantage of differences, in density, structure, or capacity for being rendered magnetic by calcination, while no use has been made of the striking properties evinced in differences of specific cohesive strength. The separation of minerals of unequal hardness, and by reason of their greater or less susceptibility to break down into fragments of different sizes, is not possible with the ordinary crushing or stamping mill; but it is different when the mass is thrown violently against a hard resisting surface, in which case, if the velocity is properly proportioned, only the more brittle substances are broken. In order to obtain a proper separation of iron pyrites and zinc blende, the author has been led to experiment on the use of Vapart's centrifugal breaker, not only as a crusher, but as a separating machine. When this apparatus is driven at 800 revolutions per minute, lumps of iron pyrites of 20 to 25 millimetres diameter are reduced partly to dust and partly to grains of 1 to 1½ millimetre; but when the velocity is reduced to 400 revolutions they are scarcely touched. Blende, which is of inferior hardness, is reduced to the finest fine-stuff at 800 revolutions, while at 400 it leaves the apparatus partly as dust and partly as grains of 0.5 to 3.0 millimetres in diameter. If, therefore, a mixture of the two minerals is treated at the lower speed of 400 revolutions per minute, the pyrites are almost entirely unaltered, while the blende, being very finely reduced, may be separated by a simple sifting process. In order to make the process continuous in action the crushed ore is passed through a hopper into a drum sieve making 9 2-10ths revolutions to every 100 of the mill, and divided into three parts with holes of 1, 2, and 3 millimetres respectively. The coarser stuff passes into a second drum with two divisions, having holes of 6 and 8 millimetres respectively, which is driven at 8 revolutions per 100 of those of the crusher. The size of the sieve holes depends upon those of the particles operated on, and it is important that these shall be as nearly uniform as possible. The operation may be carried on wet or dry; but in the latter case it is essential that the material shall be as free from moisture as possible, as the powder, if damp (with about 4 per cent. of water), binds, and easily stops up the holes in the sieves. The dust is also a very great inconvenience, which, however, may be remedied by the use of a small jet of water.

The separation of the two minerals is not completely effected, as the angles of the grains of pyrites are apt to break off, even at moderate speeds of the machine, and to become mixed with the fine blende; but it is sufficient for ordinary commercial purposes. The economic value is shown by the following calculation. Mixed ores with equal contents of blende and pyrites are worth at the utmost about 10*l.* per ton, and are not easily disposed of at that price; but when subjected to the treatment described above, the products are 11 dwts. of pyrites, with 3 per cent. of blende, worth 9*l.* 6*l.*, and 9 dwts. of blende, worth 3*l.* 6*l.*, or a total of 4*l.* for the separated products. Taking the cost of the raw material at 10*l.*, and the working cost at 9*l.*, the profit on the process appears to be 30*l.* 3*l.* per ton of stuff treated. The amount of material that can be crushed in a Vapart mill is about 5 tons per hour passed once through, so that a single apparatus will be sufficient for even a very productive mine, as mixed ore of this kind never forms more than a comparatively small portion of the total produce.—H. B.

— BY F. BUTTENBACH: Berg- und hüttenmännische Zeitung, vol. xli., p. 163.

\* From JAMES FORREST'S "Abstracts of Papers in Foreign Transactions and Periodicals," for the Proceedings of the Institution of Civil Engineers.

## A NEW METHOD OF REFINING GOLD CONTAINING COPPER.\*

From the author's experience, one of the most difficult problems in refining gold by sulphuric acid is that of treating silver and gold alloys which contain much copper, as when the proportion of the latter metal exceeds 100 per 1000, fine silver must be added in order to bring the copper down to the required limit; which not only increases the weight of alloy to be dissolved, but gold dilutes the proportion of gold, so that it is difficult to get it perfectly fine. The method patented by Roessler and Ochsenius for such alloys is first to convert them into sulphides by fusion with an excess of sulphur, until the silver and copper are completely converted into regulus, and then to blow air upon the surface of the melted regulus. This oxidises a part of the sulphur with the reduction of an equivalent quantity of silver, which carries down the whole of the gold, giving an alloy, that, when separated, is parted by sulphuric acid in the ordinary way. A certain amount of metallic copper is also liberated at the surface by the reaction of the oxide formed upon the sulphide, but this is resulphuretted on sinking through the bath. By continuing the blowing in another crucible after the removal of the auriferous alloy, a cupriferos silver is obtained, which can be easily refined. The air-blast may be produced by a blowing cylinder or a steam jet. In the Frankfurt gold refinery the regulus, in quantities of 300 kilogs., is melted in an air-furnace in black-lead crucible, lengthened above by a cylinder of the same material, and covered with a projecting sheet-iron hood, with a pipe for the admission of the blast, which is projected upon the surface of the bath. The gases and fine-stuff, formed by the oxidation are carried by a lateral opening in the top cylinder, through a cooling and condensing chamber with numerous vertical partitions, into an absorption vessel, which is filled either with sulphuric acid at 60°, in which sulphate of copper is dissolved, or with nitric acid. When a sufficient supply of water vapour is introduced, which is done by a steam jet blower, the sulphurous acid gas is continuously oxidised and condensed as sulphuric acid at 60°, which is removed from time to time as it collects. The author considers that this method may be applied on the large scale to the separation of precious metals from mixed copper and lead regulus. In the latter case they will be collected in lead, leaving a pure copper regulus.—H. B.

— BY H. ROESSLER: Berg- und hüttenmännische Zeitung, vol. xli., p. 152.

\* From JAMES FORREST'S "Abstracts of Papers in Foreign Transactions and Periodicals," for the Proceedings of the Institution of Civil Engineers.

A petition for the winding-up of the Simon's Reef Consolidated Gold Mining Corporation has been presented by the Carta Para Gold Mining Company, and is to be heard on Nov. 3.



## Registration of New Companies.

The following joint-stock companies have been duly registered—

**THE LIVERPOOL EQUITABLE DISCOUNT AND BANKING COMPANY (Limited).**—Capital 20,000*l.*, in shares of 5*l.* Lending money, discounting bills, promissory notes, &c. The subscribers (who take 10 shares each) are—J. Winchester, Liverpool; R. W. Hall, Bootle; W. Lloyd, Walton; R. Harley, Newsham Park; A. Gregory, Liverpool; W. T. Kean, Liverpool; T. J. McDermott, Anfield; J. E. Perkins, The Temple.

**THE COEDPENMAU ENGINEERING WORKS AND FOUNDRY COMPANY (Limited).**—Capital 20,000*l.*, in shares of 10*l.* To purchase certain works at Pontypridd, Glamorgan, and to continue the business in connection therewith. The subscribers are—J. Thomas, Pontypridd, 25; M. Morgan, Cardiff, 25; W. H. Matthias, Pontypridd, 25; H. Hopkins, Pontypridd, 5; D. Morgan, Pontypridd, 1; P. Williams, Pontypridd, 25; H. S. Davies, Pontypridd, 5; J. Daniels, Pontypridd, 1.

**GRIFFITHS, BERDOE, AND COMPANY (THE SANITARY PAINT COMPANY) (Limited).**—Capital 100,000*l.*, in shares of 10*l.* To purchase certain works at Liverpool, and carry on the business attached thereto. The subscribers (who take one share each) are—L. V. Hillias, Thornton Heath; W. Berdoe, Liverpool; A. Griffiths, Liverpool; H. Knight, Liverpool; P. J. Burt, Esher; S. A. Went, Thames Ditton; E. Biset, 34, Leadenhall-street.

**THE RIO DE JANEIRO CENTRAL SUGAR FACTORIES (Limited).**—Capital 141,500*l.*, in shares of 10*l.* To acquire certain concessions, and carry on the business of sugar manufacturers and refiners in all branches. The subscribers (who take one share each) are—T. Dickson, South Norwood; E. Easton, 11, Delahay-street; J. Goodson, 32, Kensington Gardens-square; W. H. Barker, Ashbourne-grove; D. A. Orsild, 14, Waverley-place; F. J. Heseltine, 1, East India Avenue; C. H. Linklater, 6, Warrford-court.

**THE LONDON TYPE FOUNDRY COMPANY (Limited).**—Capital 40,500*l.*, in shares of 5*l.* and 1*l.* To carry on a metal and other type manufacturing business, at 10, Type-street, Finsbury. The subscribers (who take one share each) are—J. Lawson, 8, Powell-street; F. J. Reid, Camberwell; L. M. Berghell, 3, West-street; H. A. Mollison, 28, Queen Victoria-street; H. W. Kempell, Brixton; E. Brinbach, 1, East India Avenue; F. Eben, 95, Palmerston Buildings.

**THE WALTER C. CHURCH ENGINEERING COMPANY (Limited).**—Capital 10,000*l.*, in shares of 10*l.* To carry on the business of a manufacturing engineer in conjunction with certain patents. The subscribers are—G. Salt, 33, St. James's-square, 100; W. H. Baker, Brighton, 100; F. J. Baker, Brixton, 1; A. Leckendorf, 12, Savage Gardens, 60; F. Frank, Streatham, 100; R. Frank, Streatham, 100; J. Woodall, Scarborough, 50.

**HASTINGS AND ST. LEONARD'S GAIETY THEATRE RESTAURANT COMPANY (Limited).**—Capital 32,000*l.*, in shares of 10*l.* The business at Hastings and elsewhere of a theatre proprietor and manager, public entertainer, &c. The subscribers are—G. Gage, Hastings, 500; F. G. Phillips, Hastings, 20; C. J. Lewis, Hastings, 20; T. Osgar, Hastings, 10; J. Frewer, Hastings, 5; J. Gosling, Northampton, 20; C. Ticehurst, Hastings, 5.

**THE SOUTHBOURNE-ON-SEA FREEHOLD LAND COMPANY (Limited).**—Capital 60,000*l.*, in shares of 10*l.* The business in all branches of a land and building society. The subscribers (who take one share each) are—J. L. Erskine, Bournemouth; G. A. Leckie, Bournemouth; E. O. Wollaston, Bournemouth; E. W. Douglas, Christchurch; J. G. D. Douglas, Bournemouth; C. Waters, Bournemouth; C. W. Wyatt, Bournemouth.

**THE TOTTENHAM LITERARY INSTITUTE, BATHS, AND LECTURE HALL COMPANY (Limited).**—Capital 10,000*l.*, in shares of 1*l.* To establish and maintain washing and swimming baths, library, writing rooms, &c. The subscribers (who take five shares each) are—A. E. Langford, Tottenham; J. Clennan, 27, Change-alley; R. A. J. Worman, 38, Green Lanes; R. Weddop, 6, Rawlinson-terrace; A. Howe, Tottenham; F. Roberts, Enfield; F. Biggs, Barnsbury.

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## CASTING GOTS OF STEEL.

The adaptation and application to the mould ordinarily employed for casting such ingots, of a feeder composed of fire-clay or other suitable non-conducting material, for the purpose of making sound ingots by obviating the tendency hitherto found in the use of the ordinary mould to produce ingots which are more or less hollow through a considerable portion of their length, owing to the solidifying and consequent contraction of the steel at the top end and at the sides of the mould before it has become solid below and in the centre constitutes the invention of Mr. J. D. ELLIS, managing director of John Brown and Co., of Sheffield. It is stated that by the application to the mould of a feeder of non-conducting material, the molten metal after passing into the feeder will remain longer in a molten condition than it does in that part of the mould where such metal impinges on the metal sides of the mould, and sinking towards the centre of the mould will fill up such hollow as is caused by the solidifying and consequent contraction of the metal, which is found to take place on or towards the sides of the mould and from the centre.

The feeder will be generally circular in section, but it may be of other suitable form, and it may be either open at the top or closed with only a hole for the escape of gases. It is fitted into the top of the mould, so that the molten metal as it enters at the bottom thereof as usual is caused by a head pressure to rise therein, and fill the whole of the mould, and the whole or a part of the tube or receiver which forms the feeder. This feeder may be fitted to the mould so as to be held in position by a metal frame inclosing it, such metal frame being secured to the mould by pins and cottars or it may be otherwise fitted thereto. If the feeder be closed at the top, the metal frame may be made to cover it completely, but with a hole corresponding with that in the said inner tube or receiver. The invention is also applicable to those moulds which are fed from the top when the molten metal is poured in through the feeder and the same results are produced, but the more ordinary method now is to feed the mould from the bottom.

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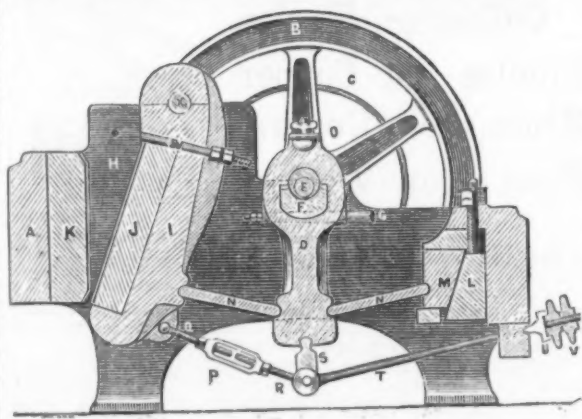
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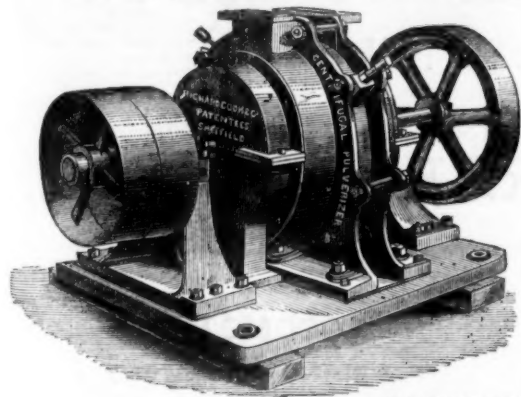
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The effect produced by this system is most extraordinary in its practical results, the power required is small in consequence of the comparative absence of friction from the working parts of the mill, the combined results of the rolling action of the crushers and their impact by centrifugal force on the material being the same in kind, but in degree far exceeding that of edge runners, the sides of the casing are formed as open wire sieves of the degree of fineness required, and a series of propelling blades attached to and revolving with the central shaft drive the material under treatment through the sieves as it is pulverised; by this arrangement the degree of fineness can with certainty be arrived at from coarse to extreme fine, and that with uniformity.

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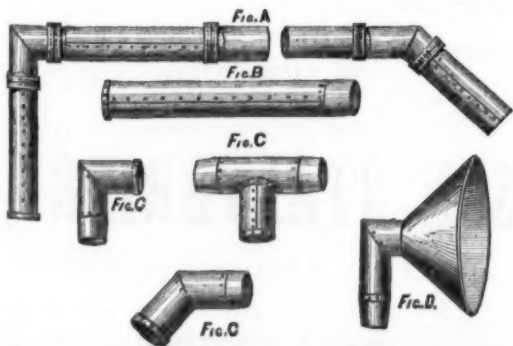
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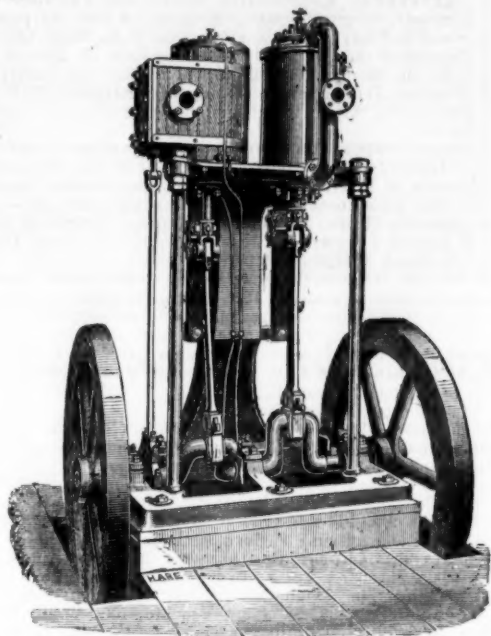
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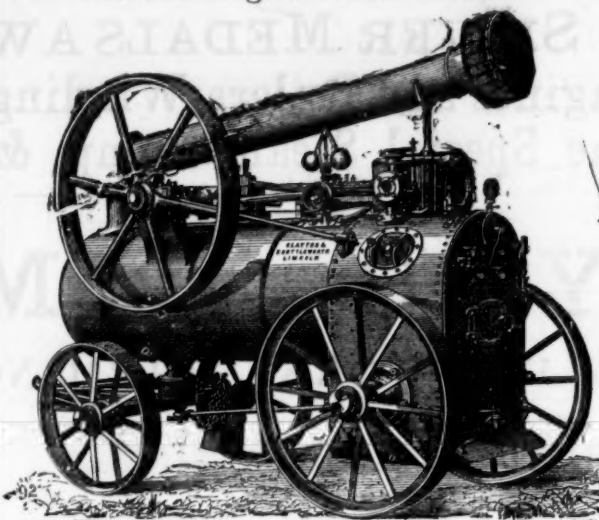
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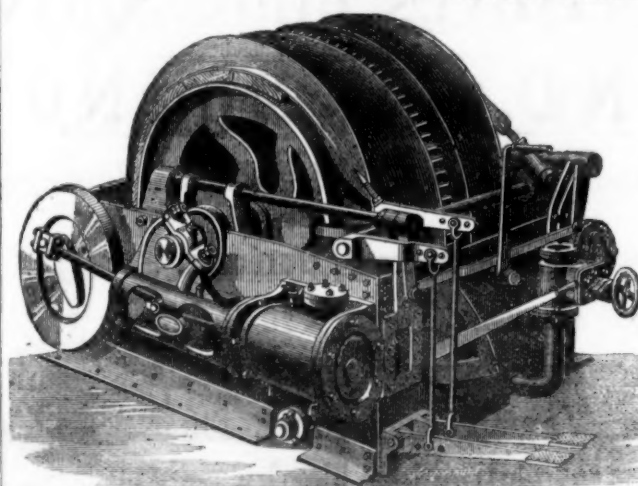
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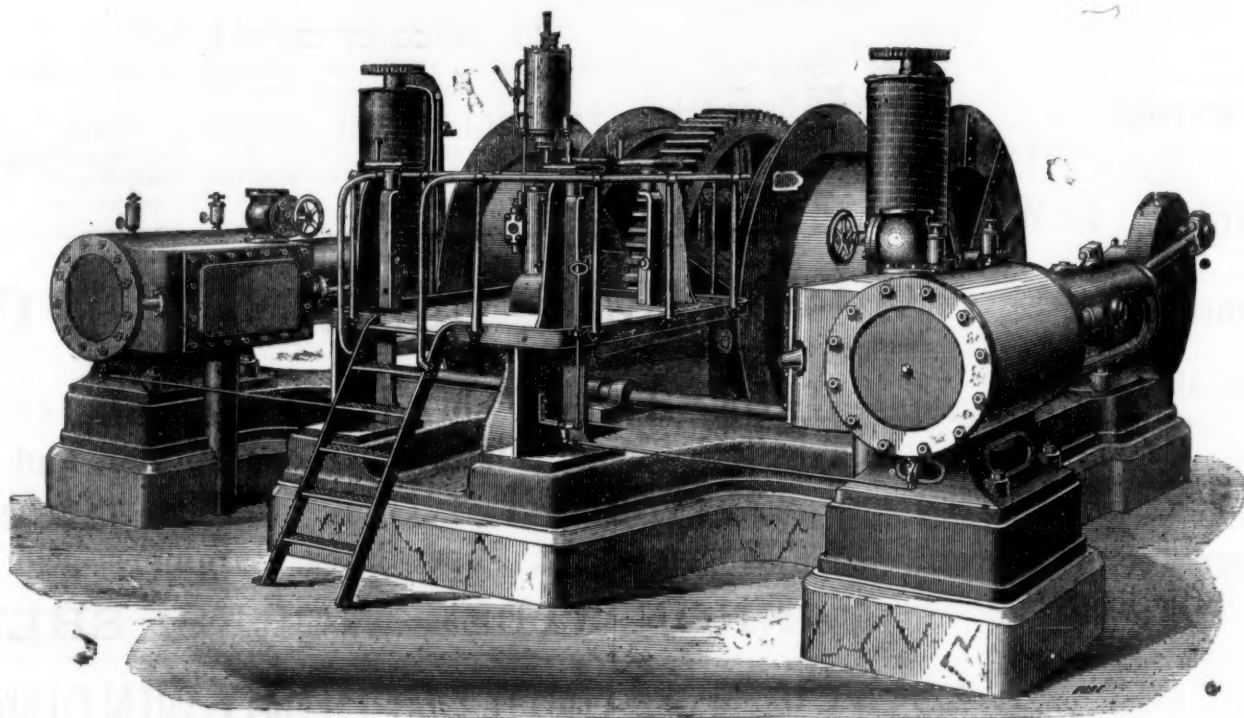
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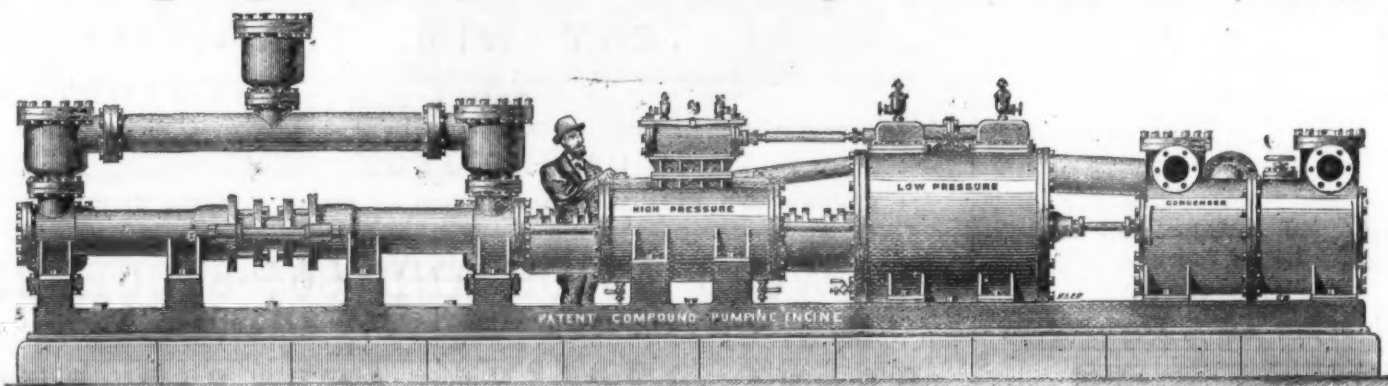
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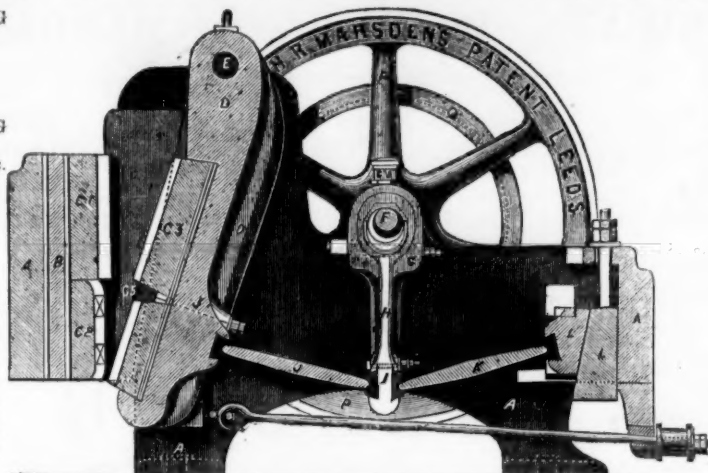
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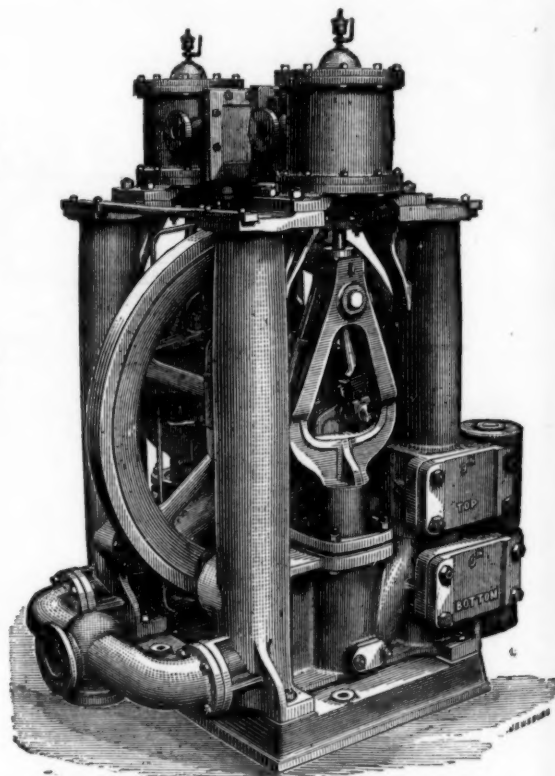
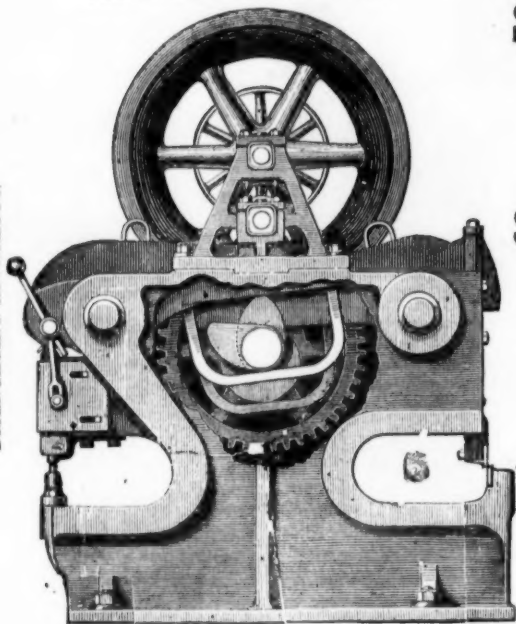
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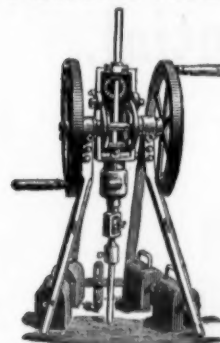
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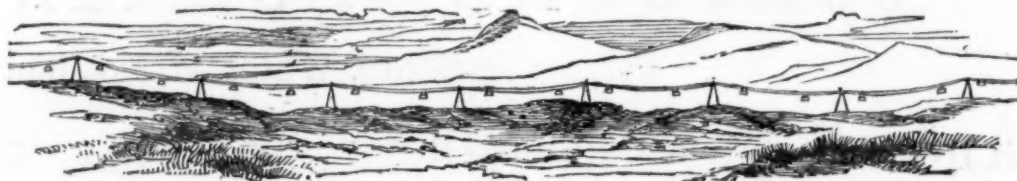
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